



FLIGHT

The
**AIRCRAFT
ENGINEER
&
AIRSHIPS**



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“FLIGHT” PHOTOGRAPHS.

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For Sizes and Prices, see Advert. on page xix.

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list :—

- 1927
- Dec. 31 .. Entries Close for R. 38 Memorial Prize (R.Ae.S.).
- 1928
- Feb. 1 .. “Aircraft in Small Wars.” Wing-Comdr. R. H. Peck, before Royal United Services Inst.
- Sept. — .. Schneider Trophy Race.
- Oct. 7-28 .. International Aircraft Exhibition, Berlin.
- 1929
- Oct. 31 .. Guggenheim Safe-Aircraft Competition Closes.

Oyez! Oyez!!
Hearty Good Wishes for a Healthy and Happy Christmas and a Prosperous New Year to all “Flight” readers.
From the Editor and Staff of “Flight,”
Christmas, 1927.

EDITORIAL COMMENT



Instruments or Inherent Stability

INHERENT stability is a term which was used a good deal in the early days of flying, but which is rarely referred to nowadays. By this we do not, of course, mean to infer that modern aircraft are unstable. On the contrary, they are probably a great deal more stable than were the majority of the pre-war aeroplanes. But the modern high performance aeroplane is required to be very manœuvrable, and as manœuvrability and stability are somewhat antagonistic, the latter has to be kept down to an extent which will enable full use to be made of the former. In the majority of service aircraft this is probably inevitable, but civil aeroplanes could, it would seem, with advantage be made a good deal more stable. The sort of stability we have in mind is something of the order of certain pre-war types. The old B.E.2C was a case in point, and in the sea-plane class there was the famous “Short two-two-five,” about which we have heard pilots say that one could take it up to a few thousand feet, and then “abandon the controls and read a novel.” (Not that we would for one moment suggest that the R.N.A.S. spent its time thus!) It is quite true that the modern aeroplane does have quite a fair degree of inherent stability, but we should think there are few types on which it would be safe to abandon the controls for any length of time. The regulations for the Guggenheim competition lay considerable stress on the subject of stability, the machines being required to recover, without the assistance of the pilot, from all sorts of abnormal attitudes.

What brings the subject of “inherent stability”

to the front at the moment is the recent experience of Hinkler and MacIntosh on their unsuccessful attempt to fly from England to India non-stop. It will be recollected that these two pilots met with atrocious weather conditions. From the time they crossed the coast at Flushing until well across Europe, they did not see the ground, and when their airspeed indicator froze up and failed to operate, they were naturally very much "in the dark." So much so, and literally, in fact, that on one occasion they completely lost control of the machine and dropped from several thousand feet to a couple of hundred before they got it under control. Now it is well known that the Fokker monoplane is comparatively stable, and that it does not readily stall and go into a spin. Yet it is fairly certain that this is what did happen. True, the machine was heavily loaded at the time, and the terrifying experience occurred at night and in thick weather. But against that must be placed the fact that a Reid turn indicator was fitted, which proved of inestimable value to the pilots. In fact, without it it is doubtful whether it would have been possible to continue the flight. Yet, in spite of this, and bearing in mind that two pilots of vast experience were at the controls, disaster was avoided by the narrowest margin.

The flight took place under probably the worst conditions ever encountered on a flight of this nature and of such duration, and thus may be regarded as representing about the maximum necessity for stability, either inherent or obtained by means of special instruments. The latter mean a certain amount of extra complication with, as we have seen in the case of Hinkler and MacIntosh, the possibility of something going wrong. The very stable machine, stable by virtue of its disposition of areas and loads, will probably suffer from being uncomfortable in a gusty wind, and unless some means can be found for varying the degree of stability, so as to obtain controllability in taking off and landing, may easily possess vices which will tend to outweigh the main advantages aimed at. The position is not an easy one, but a satisfactory solution is very much needed.



The Schneider Race

The announcement of the Air Ministry that an attempt is being made to turn the contest for the Schneider seaplane trophy into a biennial event, and the fact that His Excellency Signor Balbo is agreeing, as far as Italy is concerned, to this course, does not come as a surprise, nor does the fact that Great Britain is willing to adopt this course, in view of the past proceedings of the F.A.I. That the race has now reached such proportions that holding it annually is an almost insufferable tax on everyone concerned can scarcely be denied. As far as the general public is concerned, it is likely that a biennial event will not create the same amount of interest as a yearly race would. But against that can possibly be set the fact that, given another year in which to get ready, several nations besides Italy and Great Britain may be induced to enter machines, thus



Iraq Monarch's Return

KING FEISAL, who has paid a recent visit to England, reached Baghdad by air on December 15, after an absence of four months. He was cordially received at the Imperial Airways aerodrome by a large assembly of officials, and the city was gaily decorated in his honour.

making the race a much more sporting and spectacular event than it would be if only two nations were competing. It still remains to be settled whether other countries, such as the United States, France and Germany, will agree to the postponement. If not, the race will have to be held next year, provided any challengers are forthcoming.

As regards the still unsolved question of entering British service pilots, the Secretary of State for Air made a statement in the House the other day, but although this gave an assurance that the Air Ministry would do all it could, it did not specifically deal with the question of pilots. We gather that possibly the question of pensions is involved, and that there is every likelihood of a solution being found. More than that cannot be said at the moment.



Why Not a Seaplane Club?

In his very excellent paper on the long-range flying-boat, Major Rennie touched briefly upon the subject of training of personnel in seamanship. Wing Commander Maycock preferred the term "Marine Airman," for reasons which he hinted at. Whatever one may choose to call that quality which enables one pilot, or perhaps we should rather say one crew, to save their machine where another crew would lose it, few will deny that seaplane work does require a rather specialised training. The seaplane is going to forge ahead during the next few years, and the problem of trained personnel becomes one of very considerable importance.

Although we now have in this country a considerable number of Light Plane Clubs, which are doing most excellent work in propaganda and in actual training of pilots, we have not yet a Seaplane Club. Singapore has set a splendid example by establishing such a club, with two de Havilland "Moths" as their equipment. But Singapore is not England. Would it not, we wonder, be possible for the Air Ministry to subsidise a seaplane club in this country? That such a club would be of the very greatest benefit to the nation can scarcely be doubted, and some form of source from which to draw pilots, at which to give initial training to personnel, will very soon become an urgent necessity.

It is not suggested that training on light seaplanes would in itself be sufficient for pilots who afterwards were to handle large three-engined flying-boats. But during his experience at a seaplane club a pilot would obtain a very good working knowledge of winds and tides, and the thousand and one things which a seaplane pilot has to learn to become proficient in his work. That there are difficulties we would be the last to deny. At present it is an undeniable fact, for instance, that a pair of floats cost about as much as a light plane (the machine without engine, of course), and for this reason the subsidy to a light seaplane club might have to be on a slightly more generous scale than those granted to the landplane clubs, but the importance to the nation is so great that the extra cost to the taxpayer should in the end prove a good investment.

Palestine and the R.A.F.

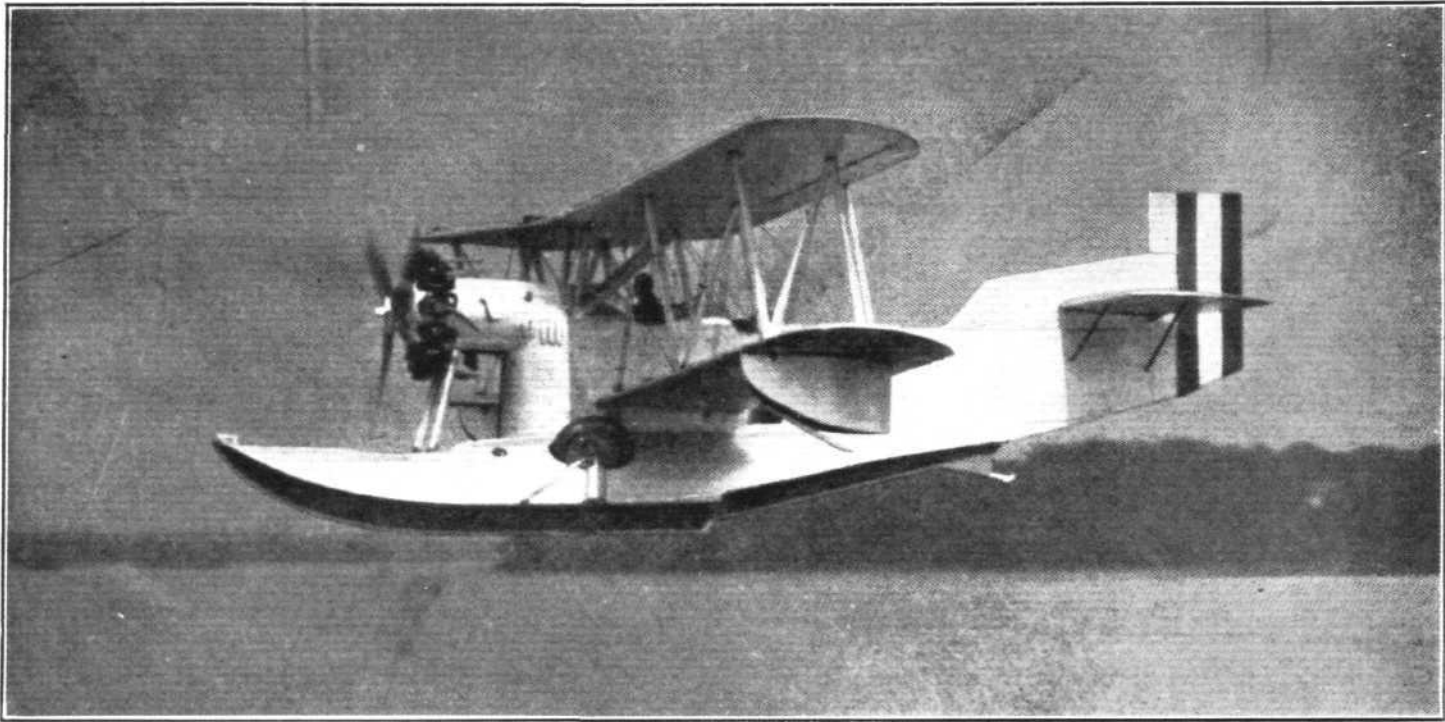
In the course of a meeting at the Central Hall, Westminster, on December 9, Sir Samuel Hoare, referring to Palestine, mentioned that since the garrisoning of that country by the Air Force the cost of the work had been reduced from £3,000,000 in 1921 to £300,000 today.

THE LOENING OL-8 AMPHIBIAN

The Latest Development of a Successful American Machine

SINCE the maiden flight of the first Loening Amphibian, in June, 1924, over 1,600,000 miles of flying have been accomplished by these machines. This very original design of amphibian—with which our readers should be well acquainted, since we have frequently dealt with it in *FLIGHT*—has become in a space of three years the standard service plane of this type for the U.S. Army Air Corps, the U.S.

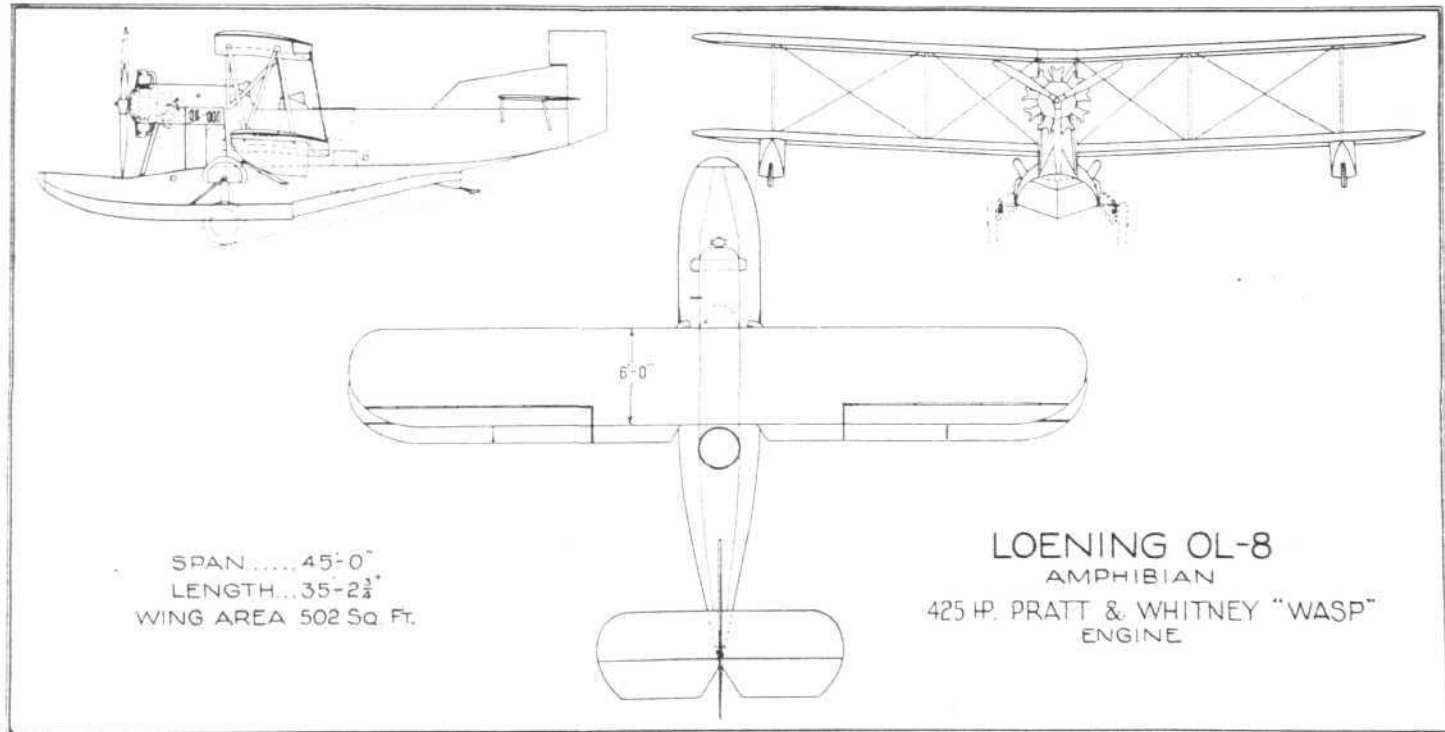
During the development of this amphibian—the 100th machine will shortly be delivered—a vast amount of practical experience has been gained, which should prove of great value to the Loening Aeronautical Engineering Corp. of New York, when this company enters the field of commercial aviation, which, it is reported, will shortly be the case. Particular interest, therefore, attaches to the new Loening



THE LOENING OL-8 AMPHIBIAN : View of the latest model of this successful type of machine in flight. It is fitted with a 425 h.p. Pratt and Whitney "Wasp" aircooled radial engine.

Naval Air Service, the Marine Corps and the U.S. Coast Guard, and is now a familiar sight at all American air stations. It is, perhaps, a remarkable example of the successful step-by-step development of an original idea (to which the constructors have persistently adhered) from the first thought on paper to the finished product itself—now being produced at the rate of two a week.

Amphibian, known as the OL-8, fitted with a 425-h.p. Pratt & Whitney "Wasp" air-cooled radial engine, which has very successfully completed all of its tests for the U.S. Navy Department. The outstanding features of, and advantages claimed for, the Loening Amphibian, which differentiate it so clearly from other types of aircraft, are, briefly—the patented Loening



THE LOENING OL-8 AMPHIBIAN : General Arrangement Drawings.

feature of the unit hull and body—a sort of combination of flying-boat and tractor fuselage—in which the functions of both are performed to the best possible advantage; the composite hull construction—a wood frame with metal-covering sheets bolted thereto; the practical and rugged amphibian gear; and the good flying qualities, which are described as giving the flying-boat the flying characteristics of the normal land 'plane.

The Loening hull is undoubtedly the most interesting feature of the whole machine. The general arrangement of the hull may be followed by reference to the accompanying illustrations, from which it will be seen that a short central flying-boat type of flotation gear is employed, upon which is built up a more-or-less orthodox type of fuselage—both neatly merging one into the other. This original design was evolved by Grover Loening in 1924, and has from the first given very satisfactory results.

The Loening type of composite wood and metal construction was first used in experimental flying-boats designed by Loening in 1911 and 1912, and again in 1914 on the seaplanes built by the Dayton Wright Co. In this type of construction the framework is wood, fastened together with metal gusset plates, the entire framing then being covered by sheet metal bolted to the wood. From experience it was found, however, that great care had to be taken to separate the duralumin sheet and the wood by a layer of fabric impregnated with bitumastic or marine glue.

members are all joined by simple, flat gusset plates of dural, bolted throughout with duralumin bolts, giving an excellent job for production. The lower part of the hull frame, and the upper longerons and diagonals framing the main fuselage section, are all built as one unit, the lower part, however, having a curved "tumble-home" side, and the upper body section a flat side with a rounded top.

The bottom is specially reinforced to withstand contact with the deck-alighting gear on aircraft carriers, and in addition, the hull is specially braced internally and externally to withstand the catapult stress incident to being shot from the U.S. Navy's powder catapult.

The pilot's seat is located well forward, between the wings, where good visibility is provided, especially for deck landings. Immediately behind is the gunner's cockpit, while below, in the deep hull, there is a cabin for the observer or wireless operator, who has a good range of vision below the wings through windows in the sides of the hull.

As regards the wing construction on the OL-8, this is also composite in that the ribs are all made of dural and the spars of spruce. This gives an excellent combination for a seaplane (particularly with the advent of the new non-corrosive duralumin called "Alclad," which is used on the ribs) because the maintenance difficulties of the small parts on a seaplane of glued-up wooden ribs coming apart are entirely solved—and yet the reliability and lightness of wooden ribs are maintained throughout.

A close-up of the 424 h.p. Pratt and Whitney "Wasp" air-cooled radial engine installed in the Loening OL-8 Amphibian.



The use of bolts instead of rivets or wood screws is the result of a very careful study, and is particularly desirable in that it makes the protection of the bolt against corrosion in salt water much easier, because each individual bolt can receive numerous coatings of enamel or bitumastic. Furthermore, in being fastened to the hull, it is not hammered like a rivet, and therefore is not likely to lose its heat-treatment against corrosion. It is claimed, therefore, that any amount of protection can be given the bolts, which is not the case with rivets. The wood frame has enough resiliency to take up the severe local strains of the land operation of this machine to prevent leaks from developing—which has always been a serious cause of trouble in amphibians.

One other advantage of this form of construction is the sealing of the joints by means of fabric tape impregnated with a special water-proof glue which, clamped between the metal covering and the wooden frame with duralumin bolts, gives a remarkably watertight result—particularly as the wood, when damp, swells sufficiently to give all the advantages of tightening found in wooden hull construction.

In the OL-8 hull, the frame consists essentially of two longitudinal girders of the Pratt truss type, cross connected by bulkheads, subdividing the hull into numerous watertight compartments.

The spruce longerons of this framework and the diagonal

The interplane struts consist of welded steel "N" struts with the usual streamline wires bracing the two-bay wing, all being held by simple flat-plate metal fittings which project through the wing, but which are carefully boxed in so that no salt water can enter the wing around the fittings. Both top and bottom 'planes have a dihedral angle of 3 degs. and a stagger of 12 in., but there is no sweep-back. Ailerons, of high aspect ratio, are fitted to top and bottom 'planes, the lower ailerons being operated by cables in the bottom wings, and the upper ailerons being actuated by struts from the lower ones.

The Loening 10A wing section is employed on the OL-8, a section, the details of which have never been published, developed by the Loening engineers, that has given exceptional results. It may be of interest to note, in passing, that this is the same section which, applied to D.H.4-type machines, with no other change, increased their speed over the R.A.F. 15 section by over 13 m.p.h., decreased the landing speed 11 m.p.h., and increased the ceiling 2,000 ft. Several D.H.'s are now in service of the U.S. Government, using Loening 10A wings—the most notable being a special D.H. used by Major E. H. Brainard, Chief of the U.S. Marine Corps Aviation Service.

The wings have a high safety factor, and all forms of "stunting" can safely be carried out on the Loening

amphibian fitted with these wings. Special fittings that have been devised in the development of the amphibian enable a very quick set-up and take-down.

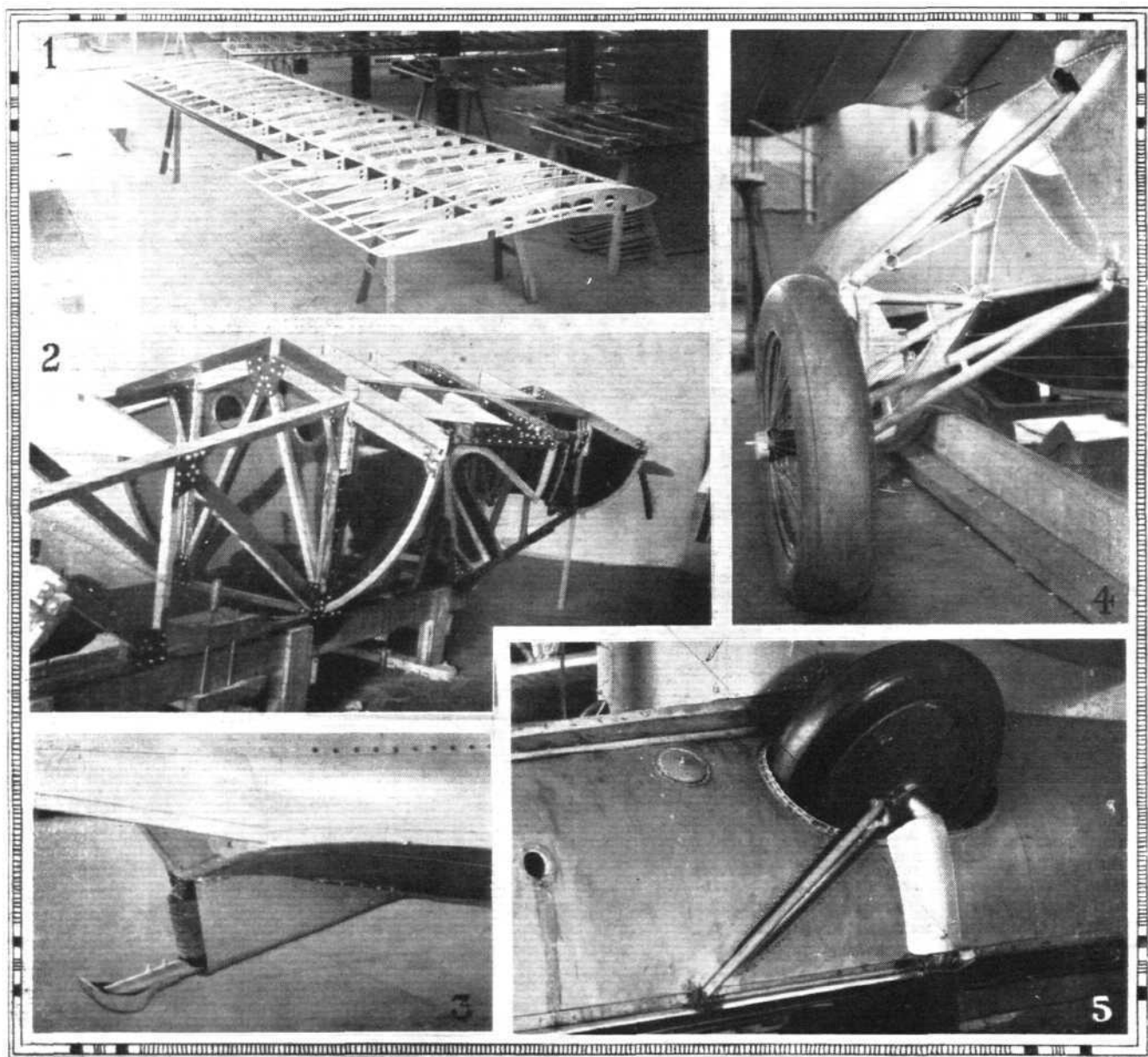
Both fin and rudder are metal-covered throughout, the rudder, which has much the same construction as the hull, being exceptionally large. The elevators and stabiliser are of usual wood and fabric construction, braced by diagonal steel struts, giving a very rigid structure on torsion. The stabiliser is not adjustable in flight, but, what amounts to the same thing, a spring adjustment on the elevator controls relieves the pilot of tail-heavy or nose-heavy balance.

Another characteristic feature of the Loening amphibian is the patent landing gear, on which some considerable amount of research and experiment has been applied, with the result that it is now an entirely satisfactory and practical proposition.

hull, from the chine upwards, in order to prevent water, driftwood, etc., from sweeping in and so jamming the gear. The gear is operated either by an electric motor, with suitable drive shafts, or by a simple hand crank and cable system.

Spring skids are also mounted on the wing-tip floats, which not only protect the floats from driftwood in the water, but they also protect the floats from injury on the land. At the rear of the main section of the hull is a "husky" tail skid of steel tubing bearing up against rubber disc absorbers; on the skid is mounted a detachable shoe for wear and tear.

The Pratt and Whitney "Wasp" engine is mounted in the "nose" of the fuselage—or its equivalent—in a somewhat unusual manner. In addition to steel tubes running fore and aft to the longerons from the flanged dural engine plate, there are two vertical struts extending down, and



THE LOENING OL-8 AMPHIBIAN: Some constructional features: (1) A wing panel, with spruce spars and duralumin ribs. (2) Forward section of hull frame (spruce), to which is bolted the sheet duralumin covering. (3) The neat tail-skid unit. (4) and (5) The Amphibian landing gear, shown "down" and "up."

In this, the wheels are pivoted on frames, raised and lowered laterally with respect to the hull. A thrust member carries the landing gear load from the top of the wheel frames, and the upper end of this thrust member—by being operated upon a slide tube through cables or screw shafts—rotates the wheel frames around an axis at the chine of the hull upwards and into the sides of the hull, so that the entire mechanism is folded away with the exception of half a wheel. The principal advantage of this folding away is not so much in the reduction of air resistance—which is somewhat negligible—but in the reduction of water resistance for take-off, and in bringing the landing gear mechanism away from possible fouling with driftwood or debris, which would tend to jam it. As a safeguard, also, against the latter contingency, a cover plate, attached to the axle, folds up over the opening in the

slightly forward, from the latter to the hull. These struts, which are braced by cross wires, transmit the engine load directly to the front part of the hull, and, it is claimed, greatly reduces the usual radial engine vibration. The cowling round the engine has been reduced to the minimum so as to give ample air cooling for tropical work, while the usual rotary shutter is provided at the central portion of the cowling.

The oil tank, of 10 gals. capacity, is located behind the engine, and the petrol tank, of 140 gals., is located in the lower part of the hull.

Dual control is provided, wheel type in the forward and stick type in the rear cockpits. The OL-8 is exceptionally controllable under all conditions—turning on rudder alone, the machine takes up the correct bank without the aid of

the ailerons, while the longitudinal balance is also very good. The quick take-off from water is another feature of the OL-8—this generally taking about 10 seconds, with full load.

Although primarily designed for Army or Navy observation work, the Loening OL-8 is also particularly suitable for other purposes, such as aerial photography—it will be remembered that Loening amphibians were successfully employed for the aerial survey of the Rainy Lakes and Canadian border, in Cuba, Venezuela, and Alaska.

The principal characteristics of the Loening OL-8 are:—

| | |
|------------------------------|---------------|
| Span | 45 ft. |
| O.A. length | 35 ft. 2½ in. |
| Height (wheels down) | 12 ft. 11 in. |
| Chord | 6 ft. |
| Gap | 5 ft. 11½ in. |

| | |
|--------------------------------|---------------|
| Stagger | 1 ft. |
| Dihedral and incidence | 3°. |
| Wing area | 502 sq. ft. |
| Area of ailerons | 60 sq. ft. |
| „ „ elevators | 28 sq. ft. |
| „ „ rudder | 17.4 sq. ft. |
| „ „ stabiliser | 43.4 sq. ft. |
| „ „ fin | 15.8 sq. ft. |
| Weight, empty | 3,253 lb. |
| Weight, laden | 5,253 lb. |
| Weight per h.p. | 12.3 lb. |
| Weight per sq. ft. | 10.4 lb. |
| Speed range | 50—124 m.p.h. |
| Climb in 10 mins. | 5,500 ft. |
| Ceiling | 13,000 ft. |
| Range (cruising) | 560 miles. |

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

THE COMMITTEE, DECEMBER 14, 1927

Present.—Lieut.-Col. Sir Francis K. McClean, A.F.C., in the chair. Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Griffith Brewer, Lieut.-Col. M. O. Darby, O.B.E. Capt. C. B. Wilson, M.C. Harold E. Perrin, Secretary.

Election of Members.—The following new members were elected:—

Charles Edward Chilton.
Jack Eliot Duckham.
Stanley William Hiscocks.
George Edward De Lengerke.
Charles Roosmale McMullin.
Count John E. Johnston-Noad.
Squadron-Leader Lionel Guy Stanhope Payne.
Christian E. Pitman.
Lieut.-Col. Douglas Charles Robinson.

Aviators' Certificates.—The following aviators' certificates were granted:—

- 8180 Thomas Russell Harmer, Norfolk and Norwich Ae. Club.
- 8181 Edward Angus Livingstone Parker, Hampshire Aeroplane Club.
- 8182 Peter William Hoare, London Aeroplane Club.
- 8183 John James Lister, R.F.C. Graduation Certificate.
- 8184 Andrew Douglas Farquhar, Wm. Beardmore and Co., Ltd.
- 8185 Frederick Ernest O'Meara, R.A.F. Graduation Certificate.
- 8186 William Martin Blagden, Lancashire Aero Club.
- 8187 James Esme Glenn, Newcastle-upon-Tyne Ae. Club.
- 8188 Fred Gough, Norfolk and Norwich Ae. Club.
- 8189 Frits Drescher, De Havilland Flying School.
- 8190 Henry Hollingdrake, Lancashire Ae. Club.
- 8191 John James Scott Robertson, Newcastle-upon-Tyne Ae. Club.
- 8192 Basil Alfred Gregory Meads, Lancashire Aero Club.
- 8193 John Henry Patrick Graham, Hampshire Aeroplane Club.
- 8194 Richard Ashley Hall, Bristol and Wessex Aeroplane Club.
- 8195 Archibald Havergal Downes-Shaw, Bristol and Wessex Aeroplane Club.
- 8196 Herbert Victor Barker, R.A.F. Graduation Certificate.
- 8197 Edward Cecil Theodore Edwards, London Aeroplane Club.

- 8198 Stewart John Burt, London Aeroplane Club.
- 8199 Austin Bruce Ferguson, De Havilland Flying School.
- 8200 Charles Herbert Brewer, Bristol and Wessex Aeroplane Club.
- 8201 Hon. Henry Charles Hiley Bathurst, Bristol and Wessex Aeroplane Club.

Schneider Trophy.—The report of the Schneider Committee held on December 7 was received and adopted. The report included the decision to hold the race in the month of September. Also the decision to inspect Morecambe and Liverpool.

F.A.I. Paris Conference.—Lieut.-Col. M. O'Gorman was appointed delegate to attend the Conference of the F.A.I. in Paris on January 5.

Associated Clubs General Council.—The report of the meeting of the Associated Clubs General Council held on November 29 was received.

ASSOCIATED CLUBS GENERAL COUNCIL

A MEETING of the Sub-Committee was held on Thursday, December 15, 1927, at 2 o'clock.

Present.—Lieut.-Col. M. O. Darby, O.B.E. (Royal Aero Club), in the chair; Maj. K. M. Beaumont, D.S.O. (London Aeroplane Club); Maj. Gilbert Dennison (Midland Aero Club); Alan R. Goodfellow (Lancashire Aero Club); R. J. Parrott (Hampshire Aeroplane Club); Capt. D. C. Robinson (the Bristol and Wessex Aeroplane Club); H. E. Perrin, Secretary.

The committee considered the racing programme for 1928. It was reported that the Air Ministry had agreed to assist at four official meetings in the provinces and one in London.

The Society of British Aircraft Constructors Challenge Cup.—It was decided that at each of the five official meetings there should be an inter-club race, confined to aircraft belonging to the club and flown by *ab initio* pilots. Marks would be awarded for the first, second and third places in each event.

Air League Challenge Cup.—The proposal of the Norfolk and Norwich Aero Club to hold this race in the Eastern Area on August 6, 1928, was approved.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

War "Ace" as M.P.?

CAPT. RENE FONCK, the French war "ace," is seeking to enter the Chamber of Deputies as a Deputy for the Department of the Vosges.

The R.A.F. Club.

THE Royal Air Force Club will be closed from 2.30 p.m. on Wednesday, December 28, until 12.30 p.m. on Thursday, December 29 (for the purpose of holding the annual staff dance) except in so far as affects bedroom accommodation

—with breakfast only—to residents and members who have engaged bedrooms prior to noon on December 28. The club will remain open during the Christmas holidays.

Passing-Out at Cranwell

AIR-MARSHAL SIR JOHN SALMOND and Group Capt. N. D. K. MacEwen were present at Cranwell on December 16, at the passing-out inspection. Sir John Salmond inspected the cadets on parade and then presented the prizes. He also addressed them after hearing Air Commodore F. C. Halahan's report.

THE AFRICAN SURVEY FLIGHT HOLD-UP

Up to the present most reports concerning Sir Alan Cobham's unfortunate hold-up at Malta have been somewhat incomplete, and we are therefore glad to have the opportunity of publishing the following account, from Sir Alan himself, of what actually happened.

In the first place, it should be mentioned that the all-metal Short "Singapore" flying boat and its Rolls-Royce "Condor" engines have behaved splendidly, although flying times have so far been long, owing to continual head winds. All went well up to Marseilles, then vile weather was encountered during the flight to Ajaccio, where a landing was successfully accomplished in a very rough sea.

Soon after leaving for Malta strong head winds were encountered, with the result that they reached Malta, after a flight of 8 hrs. 25 mins., just before dark and long overdue. They alighted in St. Paul's Bay, alongside H.M.S. *Queen Elizabeth*, which had put in there owing to a heavy swell at Marsa Sirocco Bay, where the Calafrana seaplane station is located.

The next morning, after being towed into the calmer water of the bay, they took off for Calafrana, landing without any trouble alongside a pinnacle, which was waiting to receive them. There was a heavy swell running, and it was proposed to taxi the machine across the bay to the seaplane station, but Sir Alan decided that it was far too rough to attempt this. He therefore asked the pinnacle to tow them in, which they proceeded to do.

All went well until they got half-way across the bay and out of the more sheltered water, when the swell increased tremendously. Their course lay across the bay and more or less along the swell, and Sir Alan instructed the officer in charge of the pinnacle to keep head-into-wind as much as possible by steering the pinnacle fairly up-wind. In this way they were able to keep the machine more or less head on to the swell, and they drifted across the bay three-quarters into the wind.

When within 300 to 400 yards of the seaplane base "camber," and somewhat above it, the pinnacle turned at right angles in an endeavour to get behind the jetty. "This," states Sir Alan, "brought us broadside on to the rollers, and the angle at which we were tilted was alarming; so I shouted to the pinnacle to head into wind. Before this could be done we had slipped down a roller, away from the wind, dipping our starboard wing into the water so much that the side drift was too much for the starboard float fittings, which crumpled up, and the float was washed away. By this time we were into the wind, and, having taken charge of the operations, I endeavoured to drift back head-into-wind, to get into the shelter of the seaplane base, but this was impossible without turning the machine to the starboard, which I was afraid to do without a float. Members of the crew, of course, had to get on to the port wing in order to trim the machine. I knew that the only place of shelter would be in the region where we had landed, under the shelter of the cliffs, and with three of the crew out on the port wing, we were towed slowly back across the bay, keeping the machine more or less head-into-wind all the time."

However, they were able to survive the heavy swell and, after a very difficult and trying experience, to anchor under the shelter of the cliffs, where the machine was left with the pinnacle standing by. Three days later, the wind having dropped, the machine was successfully towed across to the seaplane base "camber" and moored up.

It was impossible to get the machine on the cradle owing to the heavy swell, which, although the wind dropped, increased rather than abated. The starboard wing was kept out of the water by weighting down the port wing. A suggestion to tow the machine to a mooring in the shelter of St. George's Bay was rejected, as it was considered that the operation would be too risky under the circumstances.

All went well until Tuesday afternoon, when one of the worst gales that can be remembered on the island, sprang up, with the result that there was a swirling swell, with the wind right across the swell inside the "camber." About 2.30 p.m., it was noticed that the port float was beginning to sink and did not rise properly on the swell. Capt. Worrall was able to leap on board from a boat and heave the ballast off the wing tip; he then went to the very end of the starboard wing tip, but this made no difference and did not lift the port float out of the water. Everyone feared that the port float had become water-logged, and it was realised that the only hope for the machine was to endeavour to get it up the slipway on to an improvised cradle that was handy. An Air Force sergeant managed to get on to the machine with Worrall, and after tremendous efforts, the machine was released from the shackles on the moorings on to a line which he began to pay out. The idea was to get ropes on to the wing tips from the three shores of the "camber," so that men could guide her towards the slipway.

The waves inside the "camber" were now from 6 to 8 ft. in height, and at this stage the port wing tip float broke away and the wing sank into the water. Bonnett, the cinematographer, took a line and dived into the sea, swam to the machine, where Worrall took it from him, and his example was followed by half a dozen Air Force men, who dived in, got on to the machine, and eventually clambered up on the starboard wing tip. This made practically no difference, however, it being impossible to lift the port wing out of the water.

However, they got the machine right up to the centre slipway, and with about 200 men giving assistance, were about to get her on to the cradle, when the swell came up over the slipway and washed the cradle away; it has not been seen since! The machine, in the meantime, had just missed the slipway and drifted by, but another line was got out and an effort made to get her on to the second slipway.

During this period, she was floating with her port wing almost completely under water, with the top wing just out. The swell actually lifted her bodily on to the second slipway, and then the Air Force men managed to drag her up on the keel before the next wave took her off again. In so doing, the port wing tip was damaged on the rocks at the side of the slipway. She was secured, more or less high and dry, for the night, as it was thought unwise to drag her further, because of possible further damage to the lower port wing. Rocks and boulders a foot square, weighing several hundredweight, were scattered all over the tarmac, and the sea was washing in at the hangars doors, 50 ft. from the water's edge.

About 5 a.m. on the morning of Wednesday, November 30, although the machine was on top of the slipway, it was feared that the tail plane and hull would be damaged unless the machine was got on to the tarmac. This was carried out successfully, but the lower port wing was damaged still further in doing so. It is remarkable that the hull does not appear to be damaged in the slightest, having been drawn up on the slipway on its steel keel and gunrail. As far as can be seen, none of the structural members of the hull are strained, and it appears to be quite water-tight. Engines and propellers are intact, and the machine is now jacked up for inspection.

This storm, which has caused such damage to the machine, has been exceptional, having lasted for 10 days, and being the worst that has been experienced for many years.

Sir Alan Cobham concludes by referring to the delay as terrible, but saying that as far as repairs are concerned, "we naturally could not be in better hands than at present, for the A.O.C. has placed everything at our disposal. I am more confident about the possibilities of the "Singapore" than I ever was, and I see no reason why the flight should not be completed very successfully."

Two Roving Pilots

To discover the prospects of air transport in India, Burma and elsewhere, two R.A.F. officers, now on half-pay, will leave England this week in two D.H.9 machines converted to convey three passengers in a rear cabin. They are Flying Officers Nevill Vincent and J. S. Newall, both of whom have seen considerable service as pilots. The venture will be a private one, but it has the support of the Air Ministry for the flight will be in the nature of a thorough air survey. They fully expect to pay their way by using their machines commercially *en route*. For certain sea stages the machines will be converted into seaplanes. An engineer and a photo-

grapher, who will also act as rigger and fitter, will complete the crew and the four will be prepared to operate air services for passengers and mails for short periods in order to give business men in the areas visited a practical example of air transport.

Air Survey in New Guinea

THE Australian Commonwealth Government has made an agreement with the Anglo-Persian Oil Company to undertake surveys of two territories, New Guinea and Papua, to search for oil. Two geological parties will be provided by the Company and the Australian Air Force will supply the aeroplanes. The estimated cost of the scheme is £50,000.

PRIVATE



FLYING

A Section of **FLIGHT** in the Interests of the Private Owner, Owner-Pilot, and Club Member

WHERE THE "MOTHS" GO

THE English light aeroplane is venturing upon a world-wide market with considerable success owing to its surprising adaptability to much sterner tasks than those imposed by the private owner, for whom, one supposed, it was primarily produced. There are, in fact, more light aeroplanes sold for commercial purposes than for private flying, whilst in military aviation they are also finding favour.

The D.H. "Moth" has established a popularity that has brought its producers a distinct commercial success in these stringent days. There are few Colonies, if any, where it is not installed, and there are many where it now enters with increasing numbers. The first of the big Colonial markets was Australia, which now has between 30 and 40, shared by the Air Force, clubs and commercial concerns, as well as a few private owners, particularly amongst the members of the prominent Sydney Club. All the Australian clubs possess "Moths." These are at Sydney, Brisbane, Longreach, Melbourne, Adelaide and Perth. The Colony has the distinction of being the first country where a light aeroplane was purchased by a newspaper for the regular distribution of its copies, transport of its representatives, and urgent photographs. This refers to the Sydney Sun, which has a "Moth." The first machine bought purely for mission work will also be flying there soon when the Rev. L. Daniels takes possession of a "Moth" for touring his New South Wales parish that is larger than England. Maj. Hereward de Havilland, D.S.O., went to Australia some time ago to organise an assembly depot at Melbourne.

There is a "Moth" leaving soon for New Zealand in the company of Mr. F. D. Mill, who will be the firm's representative. He intends to carry mails and do instruction and survey work. An "Eagle" camera is being fitted to his machine.

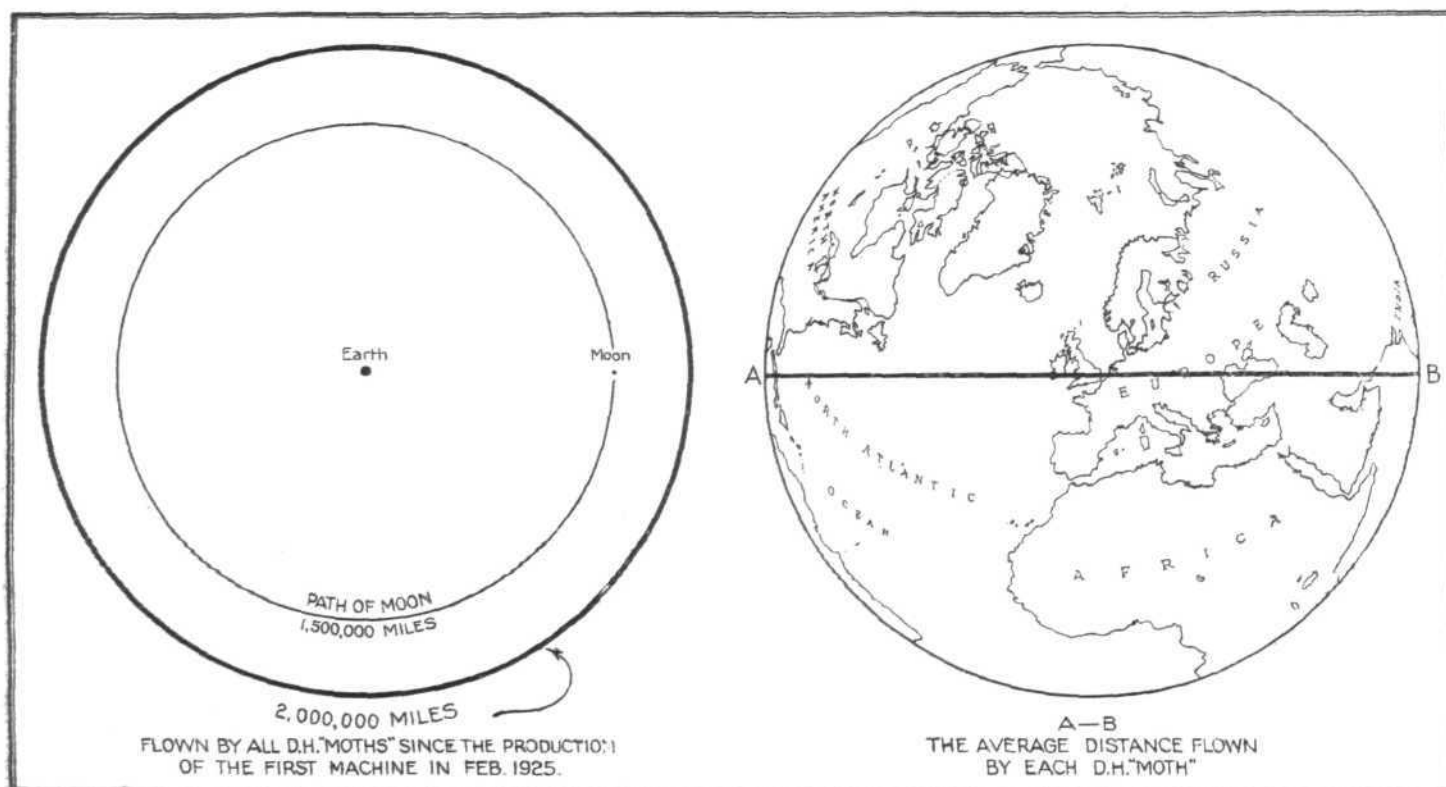
Canada

This Dominion is also proving a large market for "Moths." The first machine was bought by the Canadian Government and sent on a Hudson Bay expedition to discover navigable

channels and locate bases, two of the three found going to the credit of the "Moth." Fokker machines were also engaged in this expedition. Since then, 14 "Moth" seaplanes have been ordered for the Forestry Patrol in the Manitoba and Maritime Provinces; also 10 for the light aeroplane clubs that are being established at Ontario, Montreal, Toronto and Vancouver, etc. Two "Gent-Moths" are also to be used by the Royal Canadian Air Force at their training school at Cape Borden. Canada is finding the aeroplane invaluable for the preservation of its great forests against devastating natural causes, such as fire, although this is caused sometimes by campers failing to quench their fires.

Before the adoption of the aeroplane for fire-fighting it took men many days of travel by land and water to locate the scene of an outbreak, and this delay necessarily caused greater disaster and cost. The protection of the forests is a big task, and forestry fire-fighting services have to be maintained. Some provinces possess their own service, some hire companies for the work, whilst others call upon the Canadian Air Force. Ontario is a province with an independent service which has been in the habit of using HS-2L flying-boats.

Last year Capt. W. R. Maxwell, of the Ontario Provincial Government Air Service, visited England and chose "Moths," to experiment them on the patrols in his province. Within a week of his return to Canada he placed a preliminary order for four, and these were put into service in July. At the end of the patrolling season, which usually lasts from about May to October, they had completed 700 hours' flying and had fully justified their choice. They have been normally used for locating the fires, but on occasions when the flying-boats have not been available "Moths" have effectively carried the pump and hose, and thus proved equal to the sterner tasks usually accomplished by the HS-2L's. Survey work and the location of minerals have also been their job, whilst, incidentally, they were found convenient for operating from small lakes, where the flying-boats were not practicable.



A diagrammatic sketch showing the total performance of all D.H. "Moths" and the average distance flown by each.

and capable of doing 4½-hour patrols, which is presumably sufficient for the purpose.

As they are also so much more economical, it appears as though they will eventually supersede the flying-boats. This larger competitor was originally an American war-time pusher machine, put into quantity production by the United States Navy, and mostly constructed by the Curtiss Co. and the Standard Aero Co. It was designed for coastal patrols, accommodated a crew of four, was fitted with a single 330 h.p. "Liberty" engine, and could carry about 150 galls. of petrol. The maximum speed was 91 m.p.h., and minimum speed 53 m.p.h. It was a development of the "F boats," but on smaller lines. The HS-2L boats operating the forestry patrols have been very expensive, the petrol consumption alone amounting to the high rate of 22 galls. an hour, which is over five times the amount consumed by the "Moth." This is a glaring difference. They are said to cruise at 62 m.p.h. and have a range of five hours, so that their all-round performance is not superior to the smaller-powered machine. Apparently their one advantage is the ability to carry a bigger load.

As a result of the first year's experiment, Ontario has ordered six more "Moths" for the next season; so that it seems as though this light aeroplane will at least supersede the expensive flying-boats in this particular area.

Other purchasers of the machine in Canada include a small company named Dominion Airways, Ltd., of Vancouver, who use it for conveying passengers and mails and doing patrols; and Western Canadian Airways and the Laurentine Air Service, who will use them for similar work. Another customer was Mr. Holley, of Winnipeg, who employs his "Moth" on his flying school. Incidentally, he was the pilot who taught Sir Alan Cobham to fly. This completes the range of the machine in the Dominion up to the present. The future in this quarter seems promising. Mr. St. Barbe, the de Havilland Company's business manager, is now in Canada, superintending the formation of a distributing base which may eventually develop into a construction base. He is expected home shortly before Christmas.

In the South

Whilst we are in the new world we will trace the path of the "Moth" there to the end. Coming south, we find two in America, and then we have to go as far south as the Bahama Islands, off the Florida coast, before we pick up the thread again. A syndicate has been formed to popularise the Bahamas as a holiday resort for the winter months, and it intends to use two "Moth" seaplanes on a ferry service between the islands and Miami, on the coast of Florida, which will start in February. A well-known personage in aviation in this country is one of the leading figures in the scheme.

In the Argentine there are two "Moths," and a third is on its way to the de Havilland representative, Maj. Shirley Kingsley. In Chile the agents, Messrs. Morrison and Co., have one at Valparaiso.

Africa

This colony has created a comparatively big demand for aircraft this year of the light aeroplane class. About 18 "Moths" are there already. The first one was taken out by Maj. Miller, who has done much to popularise flying in South Africa, and will, in particular, be remembered by FLIGHT readers for his fine 8-day tour of the Union this year with a journalist in his light aeroplane. The first of the clubs here to buy a "Moth" was Johannesburg, for whom a second is on the way now. Other clubs who have already favoured the machine are Durban and East London. A syndicate has three for air taxiing. Mr. J. H. Veasey, a merchant of Johannesburg, has ordered one for his personal use. The

Scottish Flying Club Opened

On December 3 the official opening of the Scottish Flying Club took place at Moorpark Aerodrome, Glasgow. The machines first used were the club's own "Moth," and Air Commodore J. Weir's private machine, a D.H. 51. The demand for flights from the public became so heavy, however, that the Marquis of Douglas and Clydesdale lent his "Moth" for the occasion. The first passengers were Bailie Mrs. Bell, of Glasgow, and Mr. J. Buyers Black, hon. secretary of the Scottish branch of the Air League of the British Empire. For two hours joy-riding went on continuously, the charge being 5s. per flight. Women were in the majority in the stream of passengers. A few instructional flights were also given to some club members. The membership list has been closed at 120 pilot members, owing to one machine only being available at present. It was announced during the afternoon that David Carlaw and Sons (Ltd.), mechanical engineers, of Glasgow, had

Rhodesian Aviation Co., formed to popularise flying in the promising colony of Rhodesia, also has a machine on the way. When it arrives at Durban it will be flown to Bulawayo by Capt. Mail, A.F.C., with Mr. A. G. Hay as passenger.

A keen interest in aviation prevails in Kenya too, where three "Moths" will be shortly, if they are not already there.

The East

So far, only two have gone to India, those which Capt. N. Stack, A.F.C., and his companion, Mr. B. Leete, A.F.C., flew out on their memorable flight from England. In Japan the Japanese Army imported one "Moth," whilst in Singapore there is the world's first seaplane club, which will use two "Moth" seaplanes when it starts flying in February. It has been formed by the Singapore Ex-Flying Services Association.

Europe

Turning our survey on Europe, we discover that two machines went to Germany during the year and arrangements have since been completed for production there by a German company at Cassel, who are laying down a programme of 20, seven of which are ordered. In Denmark they have three machines, two of them owned by a Danish newspaper company which found them extremely valuable for publicity purposes. The third "Moth" there is possessed by a private owner. Three also will be Sweden's share when a civil flying school starts there soon, organised by Aero Materiel A.B. One machine was recently delivered to Finland by Capt. Broad, and two were lately sent by air to Italy, piloted by Mr. Alan Butler and Capt. Reeve. The Spanish Royal Aero Club has placed an order for two, and its president, Duke Estremera, one, which will be for his personal use. Their neighbour, Portugal, harbours a private owner of a "Moth."

Coming back to England, we deal with ourselves last because it is always the polite thing to do, of course, and because gossip about others is usually more interesting. Another reason is that we are discussing what is common knowledge practically. "Moths" are getting as thick as thieves here, although they are not up to any nefarious work. The public is beginning to conceive aeroplanes in terms of a "Moth." It is interesting to note that the first Air Force to favour the machine for service use was the Irish Free State Air Force, which ordered four of the Mk. I type. These are now being replaced by the type fitted with the Mk. II "Cirrus."

Among the clubs here, London has 4, Lancashire 3, Newcastle 2, Midland 2, Hampshire 3, Bristol 2, Scotland 1, and Norwich 1. The de Havilland school at Stag Lane uses six. Our own Air Force has an order placed for 20, which will be attached to Communication Squadrons. The Service already possesses several. Finally, we come to the private owners, of whom 30 own "Moths."

Summary

We have now traced the progress of this light aeroplane throughout the world covering the period from the time when the first model was flown in February, 1925. During this time the machines have, collectively, completed 2,000,000 miles flying. The present rate of production has crept up to four a week and orders in hand will take until nearly the middle of April next to execute. Methods of production are continuously being evolved which will, in time, have a favourable effect on the sales price. All parts are standardised and there is always a large stock of spares ready. The demand has meant the establishment of a department devoted entirely to the construction of the machine at the Stag Lane aerodrome. The output this year has doubled that of last year, and it is expected the output next year will double that of this year.

contributed £150 to a fund for the club. Sir Sefton Brancker paid a visit to Glasgow recently, and spoke on behalf of the club. He said that the Government desired to assist the clubs, which had now a roll of 800 flying members, 750 non-flying members, and therefore 1,550 people in close touch with aviation. They had also produced 170 pilots. Sir Sefton also expressed the view that there would be a great demand for aeroplanes for air transport, and that the nation which possessed facilities would reap a rich reward. Lord Weir, president of the club, appealed for financial support.

Development in Scotland

An aeroplane club for North Scotland with headquarters at Inverness is a project being put forward by Mr. F. Smedley, who recently went to Inverness from Manchester. It is stated that the Blackburn Aeroplane Co. proposed to send a "Bluebird" to the town for demonstration purposes. The area is said to provide excellent landing grounds.

LIGHT 'PLANE CLUBS

London Aeroplane Club, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.
Bristol and Wessex Aeroplane Club, Filton, Gloucester. Secretary, Lieut.-Col. C. Fleming, Filton Aerodrome, Patchway.
Hampshire Aero Club, Hamble, Southampton. Secretary, Maj. Ross White, Hamble, Southampton.
Lancashire Aero Club, Woodford, Lancs. Secretary, C. J. Wood, Oakfield, Dukinfield, near Manchester.
Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Maj. Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.
Newcastle-upon-Tyne Aero Club, Cramlington, Northumberland. Secretary, A. H. Bell, c/o The Club.

Norfolk and Norwich Aero. Club, Mousehold, Norwich. Secretary, H. O. Bennett, 5, Opie Street, Norwich.
Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria Street, Nottingham.
The Scottish Aero Club, 101, St. Vincent Street, Glasgow. Secretary, Harry W. Smith.
Suffolk Aeroplane Club, Ipswich. Secretary, Courtney N. Prentice, "Hazeldeil," Stowmarket, Suffolk.
Yorkshire Aeroplane Club, Sherburn-in-Elmet, Yorks. Secretary, D. M. N. Coles, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

REPORT for the week ending December 18.—Flying time: 21 hrs. 55 mins. Dual instruction, 9 hrs. 15 mins.; solo flying, 11 hrs. 50 mins.; passenger flights, 50 mins.

Dual instruction.—With Capt. F. G. M. Sparks: J. H. Percy, H. M. Samuelson, A. C. M. Jackman, Maj. E. G. Hume, J. Barros, J. A. Simson, D. S. Schreiber, Rich Hayes, A. G. Fowler, H. B. Michelmores, J. P. Edginge, G. E. Clair, L. Rowson, G. Paul. With Capt. S. L. F. St. Barbe: J. A. Simson, Miss Wilson, J. H. Percy, Maj. E. G. Hume, G. C. Gotheridge, F. C. Fisher, L. G. Sykes.

Solo Flying.—O. J. Tapper, E. C. T. Edwards, H. M. Samuelson, J. A. Simson, A. C. M. Jackman, R. Sanders Clark, J. J. Hofer, C. E. Murrell, Rich Hayes, D. P. H. Esler, A. G. Fowler, A. R. Ogston, Sqdn.-Leader R. M. S. Veal, Maj. K. M. Beaumont, Lieut. E. L. D. Moore, B. B. Tucker, J. H. Saffery, G. Paul.

Passenger Flights.—With Capt. F. G. M. Sparks: R. B. Swan. With E. E. Stammers: R. B. Swan.

On Friday, December 16, A. G. Fowler completed the tests for his aviator's certificate.

BRISTOL & WESSEX AEROPLANE CLUB

REPORT for week ending December 17.—Flying time: 14 hrs. 50 mins. Instruction, 4 hrs. 25 mins.; soloists, 8 hrs. 30 mins.; passengers, 1 hr. 55 mins.

Instruction (with Mr. E. B. W. Bartlett): Messrs. Arnold, Garnett, T. H. Clarke, R. A. Hall, Walwyn Farr, Tiarks, and Stephens.

Soloists under instruction: Messrs. Hon. H. C. H. Bathurst, Downes-Shaw, Arnold Brewer, and Jopp.

"A" pilots: Messrs. C. E. Pitman, R. A. Hall, and Tratman.

Passengers with Mr. Bartlett: Miss Hodges and Mr. Hodges.

Passenger with Mr. C. E. Pitman: Mr. E. Pitman.

Saturday was a fine day, and most of this week's flying was done on that day, during the earlier part of the week it looked as though the club would be rendering a blank report on this week's flying.

We report this week the arrival of another "Moth" in the club hangar. The property of Mr. C. E. Pitman, bringing our private owners up to two. Mr. Pitman brought the machine down from London on Thursday.

HAMPSHIRE AEROPLANE CLUB

REPORT for week ending Friday, December 16.—Total flying time: 11 hrs. 10 mins. Dual, 7 hrs.; solo, 3 hrs. 45 mins.; tests, 25 mins.

Dual: Capt. Kirby, M.M., R.N.R., Messrs. Kerry, Lowe-Wyde, Hall, Whittle, Swinburne, Dickson, Storey, Berney, Lieuts. Mandeville and Richardson, R.N.

Solo (unlicensed): Capt. Kirby, Capt. Molyneux.

Solo (licensed): Lieut. Oliver, R.N., Flight-Lieut. Hamersley, M.C., Messrs. Ash, Fagan, Bowen.

Mrs. Ranaid flew with Flight-Lieut. Hamersley and Mr. Christmas with Mr. Ash.

"Great Britain has a temporary climate." This was quoted last week in the daily papers as a recent schoolboy howler, but the bright lad who created the expression had a certain amount of justification for his statement, for this week we have experienced rain, high wind, fog, and a soupçon of sleet; each for a short time.

One machine only in use this week, our second "Moth" having the spare engine installed.

We are sorry to have to state that Mr. MacCracken, who has been chief ground engineer to this club since its inception, is leaving us to take up a position which will offer him greater outlet for his abilities. Our only consolation is that it will be nice to be able to carry on a conversation with his successor without having to unravel the brogue. MacCracken takes with him the best wishes of all our members for his future success and happiness.

On the subject of good wishes, here's all the best to all the other clubs for a "bumper" Christmas. This does not apply to landings.

This club will be closed as far as flying activities are concerned from Friday, the 23rd, to Thursday, the 29th, both days inclusive. The clubhouse (and bar!) will be open from mid-day till 2 p.m., on Christmas Day, and from 4 p.m. onwards the remaining days.

MIDLAND AERO CLUB LIMITED

REPORT for the week ending December 17.—Total flying time, 5 hrs. 40 min. Dual instruction with Mr. McDonough.—Messrs. E. Wynn, S. Duckitt, S. H. Smith, R. Jackson.

A Club for South Wales?

In recent communications to FLIGHT, Mr. R. H. Thomas, motor engineer, 9, Dunraven Place, Bridgend, states that with regard to landing grounds in South Wales, he would like to suggest a more suitable place than Cardiff, viz., Bridgend, which is situated centrally and conveniently for Cardiff, Swansea, Neath, Port Talbot, and all the South Wales mining valleys. He has an option on two sites, both of which would make excellent aerodromes. They adjoin the main Cardiff-Swansea roads. One ground is actually used by Mr. Thomas, who, conjointly with a friend, owns seven Avros and D.H.9's. He is an ex-member of the R.N.A.S., and there

Soloists.—R. Bednell, W. Swann, B. W. Barton, R. Jackson, E. J. Brighton. Flying was only possible on two days during this week.

NEWCASTLE-UPON-TYNE AERO CLUB

REPORT for week ending December 17.—Total time, 8 hrs. 40 mins. Instruction, 3 hrs. 50 mins.; "A" Pilots, 4 hrs. 40 mins.; tests, 10 mins.

Instruction with Mr. Parkinson.—Miss Rambaut, Dr. Alderson, Messrs Griffiths, Stobie, V. Heaton, L. W. Heaton.

"A" Pilots.—Mr. H. Ellis, Miss Leathart, Mr. Stobie.

Passengers (with Mr. H. Ellis).—Mr. Chapman.

The Aerodrome will be closed for holidays, on Monday, December 26, and Monday, January 2.

The weather during the past week has consisted practically throughout of snow, with bad visibility most of the time, though bright intervals allowed of a little flying on two days.

The members of the Club fully appreciate the honour bestowed upon Col. Sir Joseph Reed, the President, on his having been elected Vice-Chairman of the Council of Associate Clubs. Sir Joseph has taken an active interest in the Light Aeroplane Club movement, having attended all the meetings of the Council, which have been held, except one during his absence abroad. He is an active member of the Club Committee, supports all efforts to improve equipment or to provide new equipment and in addition, although he does not claim to be now young in years, he flies solo.

It is felt, therefore, that Sir Joseph with his knowledge of all branches of the work of the Clubs, will fill the office admirably when occasion arises.

SUFFOLK AEROPLANE CLUB

REPORT for week ending December 18.—Flying time, 3 hrs. 45 mins.

Instruction.—With Mr. Lowdell: Dr. Sleigh, S. Schofield, G. Smith.

Passenger.—With Mr. Lowdell: C. Hanson.

Soloists.—Dr. Jas. Sleigh, S. Schofield, C. N. Prentice.

Heavy falls of snow and slight engine trouble has held up flying this week. The Club will close down for the Christmas Holidays on December 22 and will re-open on December 28.

YORKSHIRE AEROPLANE CLUB

REPORT for week ending December 17.—Flying time, 14 hrs. 50 mins. Instruction, 9 hrs. 55 mins. Soloists, 4 hrs. 25 mins. Passengers, 30 mins.

Instruction (with Captain Beck).—Miss Watson, Messrs. I. Thomson, G. Thompson, Clayton, A. Crowther, H. Crowther, Evans, Humphries, Jackson, Goulden.

Instruction (with Mr. Stockbridge).—Mr. Ostler.

Solo Instruction: Messrs. Ellison, Clayton, H. Crowther.

"A" Pilots: Messrs. I. Thomson, Wood, Mann, Lister.

Passenger: (with Captain Beck), Mr. Coles; (with Mr. Thomson), Mr. Beazer; (with Mr. Lister), Mr. Hepworth, (with Mr. Wood), Mr. G. Thompson.

This has been a much brighter week, but unfortunately we had only one machine in action, G-EBRF being at Brough for various modifications, and G-EBSV undergoing a top overhaul.

Mr. Jack Clayton leapt into the atmosphere on Saturday after his eight hours' dual, accomplished in a very few weeks. He put up an extremely creditable show. Mr. Clayton is a forcible example to what extent one's keenness on flying can develop when bitten by the bug. He has completely sacrificed a prospective Christmas Holiday in Nice in order that he might be able to put in some flying time.

On Friday, our instructor spent the day over at Brough, giving instruction to some of our Hull members. As Hull is some 50 miles from Sherburn, the courtesy of Messrs. Blackburns in permitting us to use the Aerodrome at Brough helps us considerably in our efforts to meet the convenience of our long-distance members. A goodly smattering of members, together with our instructor, enjoyed a most interesting address given by Sir Sefton Brancker on "Civil Aviation," at a luncheon at the Guildhall, given by the Hull Rotarians.

The Directorate has appointed a new Secretary to the post which has recently been vacated, namely, Lieutenant Colonel Walker, who commences his duties with the Club on January 14. We all wish him a hearty welcome and a successful career with the Club.

The Club will be closed from December 23 to 30 inclusive, and not the 28th as before stated.

are a number of ex-service pilots ready to join a club in his district. One enthusiast has intimated his willingness to pay the rent of an aerodrome for the first year and make good Mr. Thomas's profits if he supplies the petrol at cost. A further gift from this benefactor may be expected if everything is successful. It will be recalled that Capt. Bailey, who owned a "Moth" for a time, mentioned that he had the promise of £2,000 towards a club if an aerodrome could be made at little expense near Cardiff. Mr. Thomas's letters suggest this requirement could be met, and we gather from them that he would very much like Capt. Bailey to communicate with him.

MODEL AIRSHIPS

It was hoped that the article in *FLIGHT* for December 1 on the technical aspect of model airships would bring forth some useful replies and criticism, and perhaps some questions from those interested in this subject. The one criticism that has so far come to light only drew attention to an obvious misprint! However, we give below another article on model airships prepared by Mr. R. H. Schlötel, of British Airships, Ltd., which we hope will provide some useful data for the lighter-than-air-o-modelist.

Model airships, like their full-size counterparts, may be developed along three distinct lines, evolving into three types: rigid, semi-rigid, and non-rigid.

The rigid consists of a light open structure, suitably braced, over which thin fabric is stretched to form the streamline-shaped hull. This structure would probably be made of wooden laths for model work, and composed of wooden hoops for the transverse frames connected by bent laths for the longitudinals.

A keelway of triangular section runs the length of the under side of the ship. From this keelway are hung or supported the necessary cars and engine nacelles or power eggs. The frames which form the stabilising and control planes are attached to the hull structure, and usually assume a cruciform shape when viewed along the axis of the ship. After the fabric is stretched over the hull structure it is suitably doped to make it taut over the framework, and by this means a streamline body that will keep its shape under all normal conditions is obtained.

The question of what material should be used on models to replace the usual fabric employed on full-size ships will need careful investigation. Weight, combined with the necessary strength, will be an important consideration.

It is usual rigid practice to place within the hull a number of separate gas cells, which are made of thin gas-proof fabric and are suitably attached to the structure. The advantage of this method is that should one cell accidentally become deflated, all the contained gas is not lost, and, further, separate cells prevent any excessive surging of the gas from end to end of the ship.

For purposes of saving weight in small model craft, it would probably be preferable to dispense with the gas cells and to inflate the actual streamline envelope itself.

In large models, of course, the effect of surging will be relatively as important as on full-scale ships, and hence the elimination of gas cells would not be practical.

The inflation of the whole envelope, however, would render the ship difficult to take from place to place, as the hull would have to be gas-tight, and any joints made in the envelope would have to be sealed before inflation. A model rigid ship would be a cumbersome thing to transport if the structure were not capable of being partially dismantled into a number of cylinders or hoops—or rather, frustrated cones—which might be made to conveniently fit one within the other. These cylinders could be erected on the model flying ground, and the joints effectively sealed by adhesive tape against gas leaks on inflation.

This subject of portability leads us to the other types of airship, the semi-rigid and the non-rigid. Both have the advantage of easy transport, when deflated, as the fabric envelope can be folded up and neatly packed into a suitable case.

The non-rigid consists of a gas-tight fabric envelope, which is kept in shape by the pressure of the gas within. From this envelope the car containing the power unit is suspended by suitable rigging. This rigging is usually in the form of a net or series of bands passing over the envelope. In order that the weight of the car shall not pull the envelope out of shape, the car must be slung at rather a long distance below it, or the fore and aft rigging will tend to hog the envelope.

Many types of rigging have been used for full-size ships in the past, the most successful of which is perhaps the Astra Torres, in which type the rigging is within the gas envelope, which is composed of three lobes when viewed in section. The ends of the rigging fans, being attached to the ridge formed by the intersection of the centre lobe with the two side lobes, the weight of the car and the forces due to airscrew thrust are more evenly distributed over the length of the ship, while the car can be brought well up below the envelope. (See accompanying diagram.)

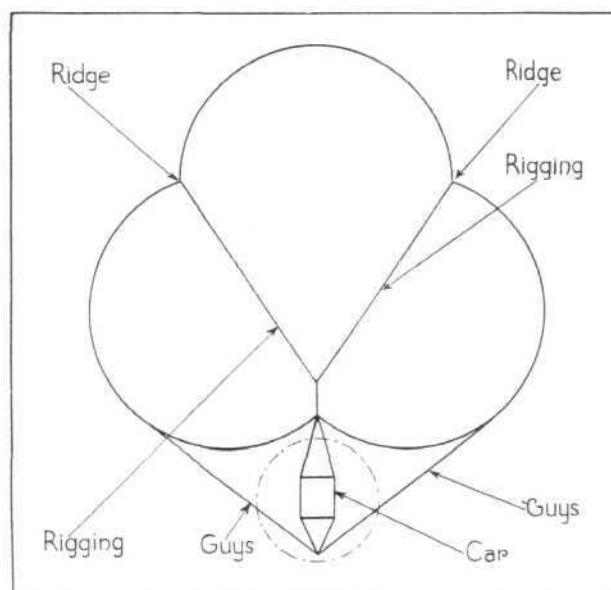
The most obvious disadvantage of this system is the bad shape of the ship, from a resistance point of view, for not only is it not of true streamline shape, but also for a given

volume the area of fabric exposed to skin friction is considerable when compared with a ship of circular section.

It was this type of rigging that was adopted in the design of the British coastal patrol airships, which did such splendid flights during the war.

In the non-rigid type of ship the stabilising fins, elevators, rudders, etc., are of very light construction, sewn to, and supported by, guys from the envelope, so that the gas pressure in the tail holds them out in the required position.

For model construction it is clear that the non-rigid ship has advantages over the rigid, the greatest being that of portability in a deflated state, but with larger models the



The above diagram shows the Astra Torres type of internal rigging referred to in the text.

problem of suitable rigging becomes difficult, as gas pressures had to be increased to insure that the envelope will maintain its shape. Gas pressure also plays an important part in deciding the maximum speed at which the ship may be propelled, for as was shown in the last article the resistance of the ship is directly proportional to the square of its velocity through the air. The maximum values of this resistance per square foot are over an area situated at the nose, and to prevent the nose blowing in when the ship is in motion, it is necessary to have a high internal pressure, but gas under high pressure, it must be remembered, does not exert so great a lift as low-pressure gas, because it is of greater density. Some form of nose-stiffening is usually provided on the non-rigid envelope to help equalize the wind pressure over a bigger area of fabric. This stiffening usually takes the form of cane or duralumin laths sewn on to the fabric and radiating from an aluminium sheet nose cap.

For many reasons the semi-rigid ship may prove itself to be the best type of model ship to construct, as it combines certain advantages of the non-rigid with those of the rigid.

Firstly, it offers facilities for transport for its envelope can be deflated and folded up into small space. The rigging problem is more easily solved, as the lift can be taken off in a series of vertical planes along the centre portion of the ship's length, a long rigid keel structure being provided along the underside of the envelope. This structure is similar to the triangular keel of the rigid ship, and carries the power unit. The advantage of vertical rigging is that the axial component of the loading in the rigging due to the weight of the car is eliminated, and the tendency of the fore and aft rigging to hog the envelope is avoided.

The design of suitable rigging offers scope for great ingenuity.

With little extra weight the keel may be extended to the extreme nose and tail of the ship, forming suitable members on to which the nose-stiffening cap and the cross structure carrying the fins, elevators, rudders, etc., may be conveniently attached, and hence a lesser internal gas pressure may be found to be necessary for maintenance of shape. The attachment of the envelope to the keel structure might

necessarily be of an easily detachable nature, for the envelope is best made separate from the keel, the latter being designed either to fold up or be capable of being dismantled and easily assembled ready for attaching to the envelope.

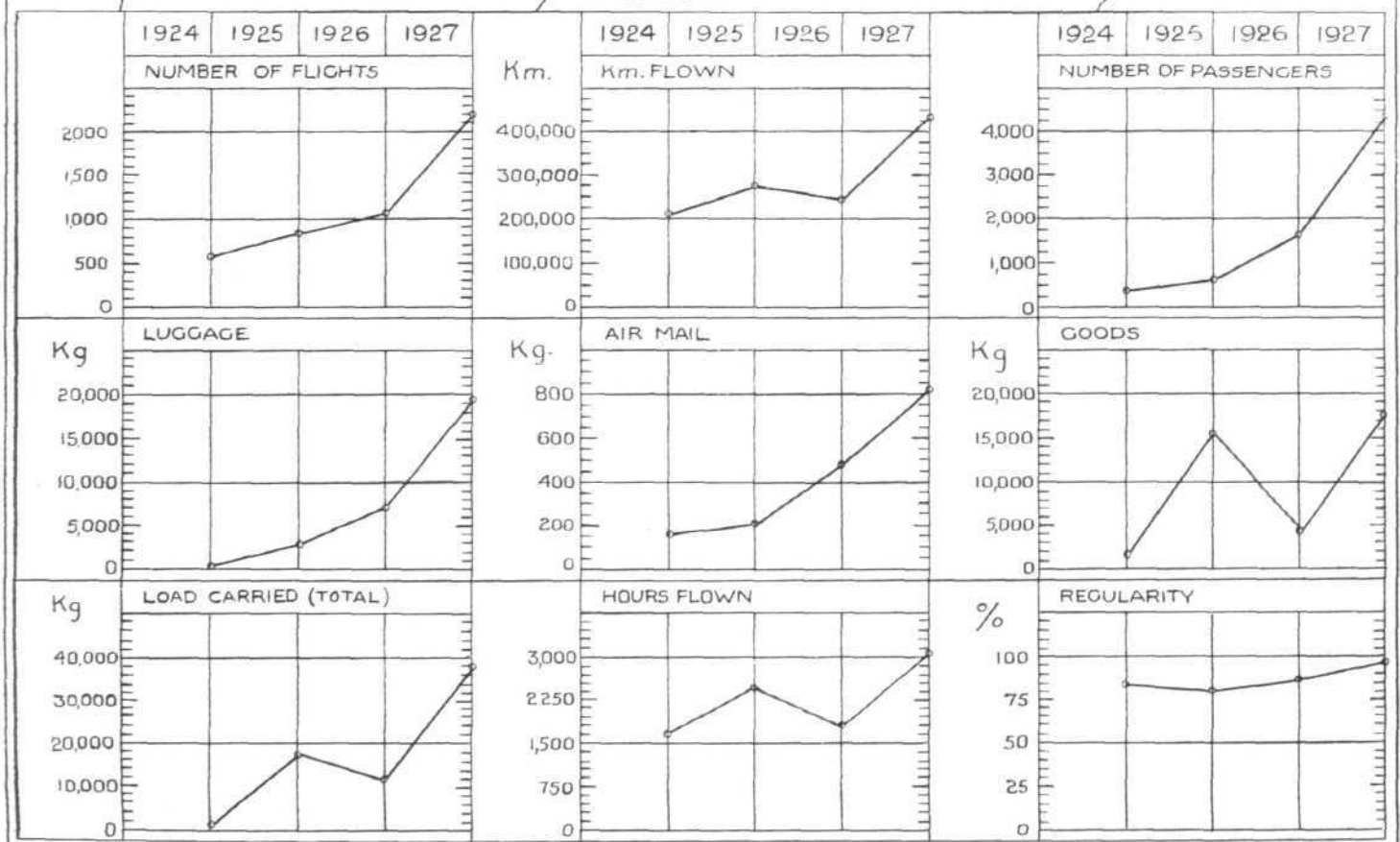
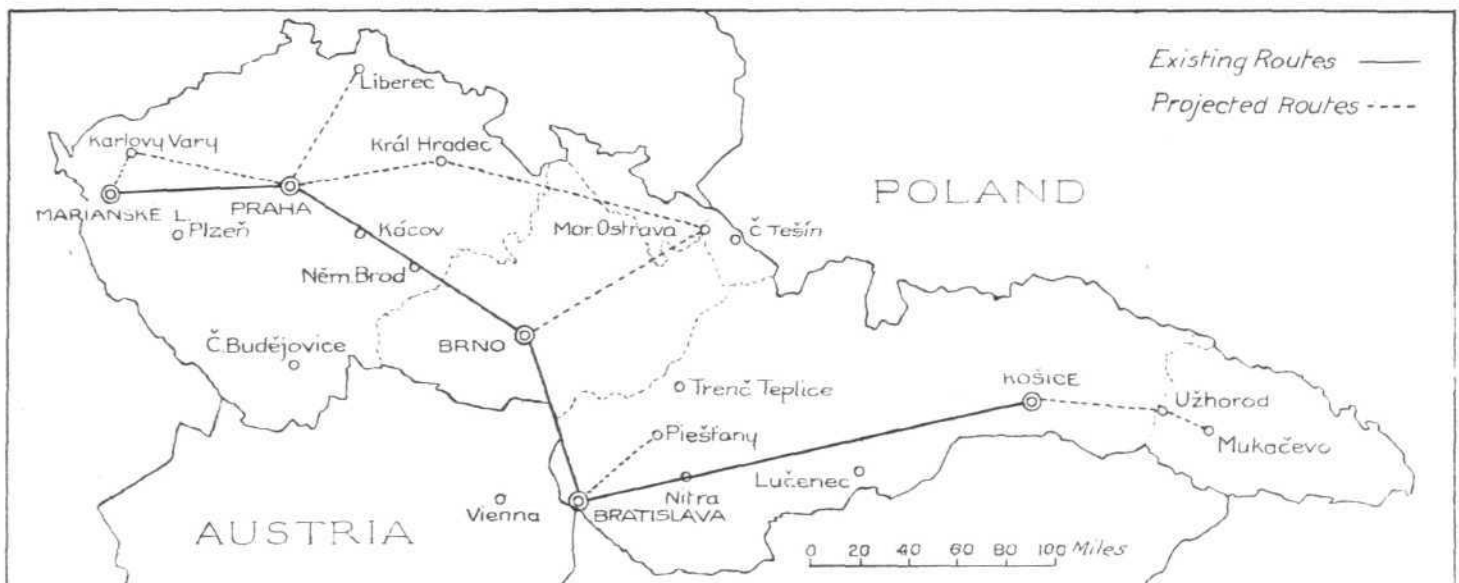
Obviously the weight of structure of the semi-rigid is far below that of the rigid model of the same dimensions, and hence a greater load will be available for power units. The power unit for small models might well be of the usual elastic type which gives such good results on the model aeroplane. The craft will travel at a lesser speed, however, and hence large airscrews turning more slowly would probably be found more efficient.

Compressed air units lend themselves to incorporation in the car of the model airship, and would be quite efficient in every way. For purposes of control, however, it would appear that some form of electric power plant would be most suitable, provided that an electric motor of light enough weight may be obtained. Power leads could be hung down from the model, which could not be expected to lift its own

batteries; these might be carried conveniently on the carrier of a cycle.

The question of ballonets or air balloons for maintaining internal pressure after loss of gas, has not been considered, because for and aft trim of the model before flight can be obtained by suitably arranging ballast weights, and as the model ship will probably not be required to fly at high altitudes, the envelope will not require gas-release valves. To conclude with a word of warning—Don't leave go of your model after it has been inflated, unless you are out to do an altitude record.

Note—We would be very glad if any reader who has had experience with model airships could assist the present movement by supplying such information he may possess, which would be of considerable help to those who are very anxious to launch forth on the somewhat unknown problem of model airship construction and flying. While we are aware that there have not been many experimenters in this connection, we know that a few attempts at lighter-than-air models have been made in the past.



CIVIL AVIATION IN CZECHOSLOVAKIA: From the Czechoslovak State Air Lines we have just received some statistics concerning civil aviation during the last four years. We have thought that a graphic representation of the results would, perhaps, convey a rather better idea than figures arranged in tables, and have therefore prepared the above charts, which are self-explanatory.

AIRISMS FROM THE FOUR WINDS

Col. Lindbergh's Latest Flight

LEAVING Washington on December 13 in his monoplane the "Spirit of St. Louis," Col. Charles Lindbergh flew to Mexico, a distance of 2,000 miles, in 27 hrs. 13 mins. He received a great welcome from President Calles and thousands of people. As he had previously estimated the flight to take 24 to 26 hours, some anxiety had been felt for his safety. Bad weather had hindered his progress nearly all the way. After leaving Tampico fog obscured the country for two hours, then he eventually confirmed his direction by reading the name on Toluca railway station and headed for Mexico City. Haze prevailed as far as North Carolina when he passed through the southern States, and darkness fell when he was in the mountains. With the help of the moon, five hours later a course was laid for the Gulf of Mexico and checked by descending to 200 ft. and spotting the white surf line along the Gulf coast. Darkness lasted more than 13 hours altogether. The President of Mexico has expressed the opinion that this flight would create a bond of relationship between Mexico and the United States of America. Col. Lindbergh has arranged to extend his flight to Guatemala, Honduras, Salvador and Panama. He may possibly go to Nicaragua and Cuba as well. A solemn session was held in his honour by the Mexican Congress who voted him an ambassador of goodwill to the Mexican people. He was presented with a gold medal. Crowds follow him wherever he goes. Mrs. Lindbergh, his mother, left Detroit for Mexico by air on December 18, to spend Christmas with her son. This flight will be one of the longest ever accomplished by a woman.

Great Flying-Boat Cruise Recommences

LEAVING Karachi on December 15, the four R.A.F. Supermarine-Napier "Southampton" flying-boats reached Bombay, covering the 560 miles in seven hours. Air Vice-Marshal Sir Geoffrey Salmond, A.O.C., Royal Air Force, India, flew in one of the machines.

Mrs. Grayson Making Another Atlantic Attempt

MRS. F. W. GRAYSON is preparing again for another

attempt upon the Atlantic. It is reported that her pilot will be Lieut. Oscar Omdal, who is at present on leave from the Norwegian Navy. He was a mechanic on the dirigible "Norge" during that airship's flight across the North Pole.

French Seaplane Safe

THE French seaplane which sent out signals of distress whilst flying on the service between Tunis and Ajaccio on December 12 is now reported to be safe. It alighted on December 13 on the sea off Cape Carbonara, the south-east extremity of Sardinia. French and Italian destroyers had searched for it in vain and as the weather in the southern Mediterranean was reported to be rough the worst had been feared. The crew on board comprised a pilot and wireless operator, and it was understood there were no passengers.

Rio de Janeiro-Buenos Aires Non-Stop

THE French airmen, Capt. Costes and Lieut. Le Brix, made a return flight from Rio de Janeiro to Buenos Aires on December 12, the non-stop journey lasting 12 hours 50 minutes. This was the first time the flight had been done without a stop.

A New Air Line

MILAN and Munich will be linked by an air line from April 15 next onwards for the transport of mails and goods, and passengers after July 1. The chosen route will pass via Brenner and Trento to Milan.

London-Cape Town Flight

MR. CARBERRY arrived at Mongalla on December 15 in his Fokker monoplane, and left for Kisumu two hours later. He reached Nairobi on December 16, and then, decided to abandon his flight. He had originally planned to reach Cape Town and then return to Kenya.

The "Red Rose" Going Strong

CAPT. LANCASTER and his passenger, Mrs. Keith Miller reached Allahabad from Agra on December 16 in their Avro "Avian," in which they are attempting to reach Australia. On December 19 they arrived at Calcutta. They have now completed 8,500 miles.

AIRCRAFT PIONEER'S GOLDEN WEDDING

It scarcely seems possible, but is a fact nevertheless, that on Saturday next, December 24, Mr. and Mrs. S. E. Saunders, of Cowes, I.O.W., will celebrate their golden wedding. Mr. Saunders, perhaps because of his close association with the sea, always impresses one as quite a young man, full of energy, keenly alive to every modern development, with a wide vision where the future of aviation is concerned, and particularly that phase of it which relates to the sea. That he should be about to celebrate his golden wedding would probably have occurred to few who know him, but the congratulations which will reach Mr. Saunders and his wife on Saturday next will be all the heartier for that, and on behalf of ourselves and our readers we would add our sincere good wishes, with the expression of the hope that Mr. Saunders may yet for very many years be allowed to continue his active and fruitful life to the benefit not only of aviation, but of the various other branches of engineering in which Mr. Saunders has done such excellent work. It is worth recalling that Mr. Saunders had the honour of receiving the O.B.E. at the hands of his Majesty.

"Sammy" Saunders was quite young when he commenced what was to prove an extremely interesting career. He comes of a boat-building family and started work in his father's workshops on the Thames no less than 56 years ago and has been engaged on designing and constructing boats of all sorts ever since. During his time he has had works at Kiel, where he went to demonstrate the superiority of his methods of construction. He has been commissioned to build racing boats in France and Italy, where craft were produced which won big events at Monte Carlo, and finally he has established a boat-building business at Cowes which, it is not too much to say, has become world famous.

The connection of Mr. S. E. Saunders with aviation dates back to the very early days. As long ago as 1912 Mr. Saunders built the hull of what must have been the first flying-boat in

Europe, and but for certain small delays would probably have been the first flying-boat in the world. This boat was built for another aircraft pioneer, Mr. T. O. M. Sopwith, whose firm built the superstructure of the machine which became known as the "Bat boat." This machine had a fairly short boat hull, and was a single-engined "pusher," with the tail carried on a girder outrigger. Not only was the machine the first flying-boat in Europe, but it was the first amphibian flying-boat in the world. Glenn Curtiss had finished a flying-boat a few weeks before, and thus the "Bat boat" just missed the distinction of being the world's first flying-boat.

That the machine was a success from the start will be realised when it is recalled that it won the Mortimer Singer Prize for starting from the water, alighting on land, taking off again and alighting on the water. The pilot who succeeded in doing this was Mr. Harry Hawker who later became such a distinguished pilot and a member of the Sopwith and Hawker firms until his untimely death shortly after the war.

During the war Mr. Saunders was called upon to construct flying-boat hulls, seaplane floats and various other types of aircraft, and the works at Cowes had to be greatly extended to cope with the increasing amount of business. At the new large works Mr. Saunders is still constructing flying-boats both of service and civilian types, as well as surface craft of all sorts. He has invented and developed a material known as "Consuta," which is ply-wood sewn together, and which finds a number of uses in boat building. It has also been used in the commercial flying-boat "Medina" which was recently completed and is to be used for commercial flying.

Recently the Saunders works have been equipped with machinery for the production of metal aircraft, and doubtless we shall soon see a metal flying-boat of distinctive design carrying on the tradition of the wooden craft that have made the name of Saunders famous.

THE DEVELOPMENT OF TORPEDO-CARRYING AIRCRAFT

AIRCRAFT designed to carry torpedoes are specialised craft, the development of which is largely governed by the special requirements of the operation for which they are designed. In addition to his normal aerodynamic and structural problems, the designer is faced with restrictions entirely due to the use of his machine from a vessel, the space of which is decidedly limited. Thus it may be said that the unfortunate designer of a torpedo 'plane has all the usual problems to overcome, and is extremely hampered in his choice of means by restrictions which either do not occur in designing other types of aircraft, or occur to a very small extent only. Realising the difficulties, it is all the more gratifying that Great Britain should have been able to develop torpedo 'planes to such a high state of perfection as that which has actually been attained. Some of the difficulties, and some of the remedies, although by no means all of either, were ably dealt with by Major F. A. Bumpus in his paper entitled "The Development of Torpedo-carrying Aircraft," read before the R.Ae.S. & I.Ae.E., on December 15. The paper deserves to be read in extenso, but while waiting for it to be published in full, the following résumé may be of interest. Major Bumpus has, of course, been associated with the Blackburn company for very many years, and has with that firm taken a prominent part in the development of the torpedo plane.

Major Bumpus divided his paper into two sections, of which the first dealt with the duties of torpedo aircraft and the second with the machines themselves and the history of their development.

In discussing the duties of torpedo aircraft, the lecturer pointed out that torpedo 'planes are essentially weapons of attack, two main methods being in use: Operating from a shore base and operating from an aircraft carrier. It was the latter to which the torpedo 'plane owed most of its development in this country. Touching upon the advantages of launching a torpedo attack by aircraft instead of by surface vessels, the lecturer called particular attention to the advantage of speed. For instance, if a destroyer intends to attack a ship sighted at a distance of seven or eight miles, and its speed is some 10 knots greater than that of the ship it is desired to attack, there will be a lapse of about 45 minutes before the destroyer is within torpedo range. In the case of a torpedo 'plane, however, the objective could be overtaken in less than 10 minutes. The difference in the distances travelled by the "victim" in the two cases might easily mean the difference between success and failure. Moreover, a torpedo 'plane can "dodge" about and thus forms a difficult target. Also, for each torpedo launched, one or at most two men are risked, while the *materiel* is only a fraction of the cost of that of a corresponding surface vessel.

Concerning the operation of torpedo aircraft, Major Bumpus stated that the means of defence against such attack were, in the case of battleships, fighting aircraft, anti-aircraft armament from a screen of destroyers around the battleships, and probably a splash barrage. The torpedo 'plane would fly high to avoid detection, dive silently towards a point considerably short of the target, flatten out about 20 ft. above the sea and, when within range, discharge the torpedo and then make off. During the approach the pilot would dodge about. Assuming that the machine got through to the point of dropping the torpedo, the problems of aiming became important, and these were rendered more difficult by the fact that the target would be moving and in all probability

manoeuvring rapidly so as to avoid the torpedo. For single ships that might be effective, but in the case of large ships, especially in formation, it took considerable time, and an evolution, once started, was not easily changed.

History of the Torpedo 'Plane

Tracing the history of torpedo-carrying aircraft, the lecturer commenced with the patents of Rear-Admiral Murray Sueter and Col. Hyde Thomson, taken out in 1914, and which were first carried into effect in a Short 200 h.p. seaplane. This was followed, in 1915, by the now famous "Short 225," i.e., a Short seaplane with 225 h.p. Sunbeam engine. As engines developed, machines with better and better performance, and carrying greater and greater loads, were produced, such as the Blackburn "Kangaroo" of 1916 (designed for torpedo work but not actually used for that purpose), the Sopwith-Blackburn "Cuckoo" of 1917, experimental machines by Blackburns and Shorts of 1918, the Blackburn "Swift" of 1920, followed later by the Blackburn "Dart," the Handley Page "Hanley" of 1922, the Blackburn "Cubaroo" (1,000 h.p. Napier "Cub") of 1924, the Avro "Ava" of 1925, and the Handley Page "Harrow," the Blackburn "Ripon," and the Avro "Buffalo" of 1926. Photographs of some of these machines were shown on the screen.

Design

On the subject of design of torpedo 'planes the lecturer stated that as far as Great Britain was concerned this was controlled almost entirely, especially as regards dimensions, by the requirements of operation from an aircraft carrier. Of design problems he referred to that of the effect of the sudden change in vertical position of the centre of gravity when the heavy torpedo was discharged. It was possible to make provision for this, and modern machines showed little adverse effect from this cause.

On aircraft carriers space was limited, although the newer carriers had enabled a certain increase in size of machine folded to be made. The question of getting off with a short run was still important, and it was an expensive luxury to shorten this by increasing the speed of the carrier. Reference was made to the use of wing slots on machines the dimensions of which were restricted by hangar accommodation and size of lift on board the carrier. The lecturer thought the value of slots and flaps a debatable point except on a basis of wings of equal size.

Maj. Bumpus concluded his paper by a reference to torpedo 'planes of the flying-boat type, working independently of an aircraft carrier, and carrying a torpedo slung on each side of the boat. There was no difficulty in discharging the two torpedoes together, but experience was still lacking as to the effect of dropping first one and then the other. Theory did not indicate any difficulty in control under such conditions. A boat operating as a torpedo 'plane would have the advantage that it could alight on the sea and await the arrival of a target, being relatively invisible and conserving its petrol supply in the meantime. The lecturer also referred to the tendency in this country to revert to the seaplane type for torpedo work, this being the type originally used, but temporarily superseded by the land-plane on account of the smaller efficiency of the seaplane. Modern progress with seaplane design had made the use of that type possible once more.

The Next Schneider Contest

THE Air Ministry announces:—His Excellency General Balbo, Italian Under Secretary of State for Air, has taken advantage of a short visit to London to discuss with Sir Samuel Hoare the future of the Schneider Trophy, and in particular the desirability of holding the contest every two years instead of annually as at present. There is general agreement that an interval of one year is insufficient to allow of adequate progress between successive contests in the technical design of marine aircraft, the development of which was the express object of the Trophy's founder, M. Jacques Schneider, and that consequently an annual contest is not in the best interests of civil aviation. The Italian and British Governments have therefore decided that they will support the project for an amendment in the rules which at present govern the contest to provide that in future it shall take place biennially. Since time may not admit of a formal alteration of the rules before the date for entries for the 1928 contest, they have further mutually agreed to notify the

aeronautical bodies concerned in Italy and Great Britain that they do not propose to support an Italian or British entry in 1928, provided the other countries which are possible competitors signify their willingness to adopt the same course. The United States, French and German authorities have been informally consulted, and are understood to be in concurrence with the above proposals.

French Air Accidents

AIR accidents of French machines amounted to 72 in 1926, of which 42 had fatal results. For the first half of this year there have been 47 accidents, of which 23 were fatal. Of the 23, enquiry showed that 12 were due to errors of judgment on the part of the pilots, four were caused by fire, three by engine failure, two by structural collapse and one each by collision and bad weather. The authorities are taking steps to remove obstacles within the precincts of aerodromes, and they are interesting themselves in the Handley-Page automatic slotted-wing device.

THE ROYAL AIR FORCE

London Gazette, December 13, 1927

General Duties Branch

Group Capt. J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E. (Deputy Director of Technical Development), is appointed Director of Technical Development, Air Ministry, vice Air Commodore J. L. Forbes, O.B.E.; Dec. 12.

Wing Commander N. J. Gill, C.B.E., M.C., is appointed Deputy Director of Technical Development, Air Ministry, vice Group Capt. J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E.; Dec. 12.

The following are placed on the half-pay list:—Wing Commander J. E. A. Baldwin, D.S.O., O.B.E., scale A; Dec. 8, 1927, to Jan. 20, 1928, inclusive. Wing Commander T. W. Mulcahy-Morgan, M.C., scale B; Dec. 17; Flying Officer C. H. Tighe, scale B; Dec. 1. Flight-Lieut. W. H. Markham takes rank and precedence as if his appointment as Flight-Lieut. bore date Jan. 1, 1925, immediately following Flight-Lieut. J. Blackford on the gradation list. Reduction takes effect from Oct. 25, 1927: Flying Officer A. B. Ball is placed on retired list; Dec. 9. C. R. Townsend, Lieut., R.N., Flying Officer, R.A.F., relinquishes his temp. commn. on return to Naval duty; Nov. 24. Flight-Lieut. M. A. Simpson is placed on retired list on account of ill-health

and is granted permission to retain rank of Sqdn.-Ldr.; Nov. 30. (Substituted for Gazette, Nov. 29.)

Accountant Branch

Flight-Lieut. P. J. Farmer is granted acting rank of Sqdn.-Ldr., with pay, whilst employed at Fleet Air Arm Accounts Office, China; April 1. The following are granted permanent commns. as Pilot Officers on probation, with effect from and with seniority of Dec. 3:—R. D. Pratt, L. Chegwidgen, F. C. Rendle, N. Walleit, G. H. White, R. L. M. Hall, V. H. Lewis, V. Matveieff, E. L. G. Le Dieu, J. R. Ackers.

Medical Branch

Flight-Lieut. E. A. Wheeler (temp. Maj., Dental Surgeon, General List) is promoted to rank of Hon. Sqdn.-Ldr.; Nov. 30.

RESERVE OF AIR FORCE OFFICERS**General Duties Branch**

C. R. S. Smith is granted a commn. in Class B as Pilot Officer on probation Dec. 13. Pilot Officer S. Summerfield is transferred from Class AA to Class C; Dec. 13. Flying Officer R. T. Bark is removed from the service; Dec. 7.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leaders: A. S. Maskeell, to R.A.F. Depot, Uxbridge, 18.11.27. G. W. Roberts, M.C., to H.Q., Iraq, 2.12.27. P. C. Shierren, M.C., and G. D. Nelson, D.S.C., A.F.C., to Aircraft Depot, Iraq, 2.12.27. H. P. Lale, D.S.O., D.F.C., to No. 30 Sqdn., Iraq, 2.12.27. G. R. A. Deacon, M.C., to H.Q., Iraq, 2.12.27.

Flight Lieutenants: A. McR. Moffatt, to Armament and Gunnery Schl., Eastchurch, 22.11.27. H. S. Scroggs, to R.A.F. Station, Bicester, 30.11.27. J. S. Nichol, to R.A.F. Station, Upper Heyford, 19.11.27. R. L. Sweeny, to R.A.F. Depot, Uxbridge, 18.11.27. G. R. Ashton, to R.A.F. Depot, Uxbridge, 18.11.27. G. C. Rhodes, L. J. Riordan, A.F.C., and H. J. Saker, to H.Q., Iraq, 2.12.27. H. J. Roach, A.F.C., to Armoured Car Wing, Iraq, 2.12.27. G. S. Oddie, D.F.C., A.F.C., to No. 6 Sqdn., Iraq, 2.12.27. A. L. A. Perry-Keene, to Aircraft Depot, Iraq, 2.12.27.

Flying Officers: V. B. Bennett, to Central Flying Schl., Wittering, 28.11.27. F. W. Boggis, to H.Q., Iraq, 2.12.27. W. J. Coadwell, D.S.M., to Aircraft Depot, Iraq, 2.12.27.

Pilot Officer J. D. Allcroft, to No. 5 Flying Training Schl., Sealand, 1.12.27.

Stores Branch

Flight Lieutenants: H. L. Woolveridge, to Armoured Car Wing, Iraq, 2.12.27. R. F. Osborne, to Aircraft Depot, Iraq, 2.12.27.

NOTICES TO AIRMEN

NOTICE TO AIRMEN**Customs Clearance for Privately Owned Aircraft Proceeding Abroad**

1. THE attention of owners of privately-owned aircraft is drawn to the necessity for obtaining the following forms before leaving Great Britain or returning to this country by air:—

| Official No. | Description of Form. | No. of forms required for each clearance. | Price at which obtainable from H.M. Stationery Office. |
|---|-----------------------------|---|--|
| 151 | Notice of departure | 2 | 4 for 1d. |
| 152 | Manifest (short form) | 3 | 2 for 1d. |
| 154c | Passenger List | 2 | 4 for 1d. |
| In addition the following form is necessary for inward-bound aircraft:— | | | |
| 150 | Air Navigation Report | 2 | 2 for 1d. |

2. Owners of aircraft contemplating journeys by air abroad are advised to obtain supplies of the necessary forms in advance. They may be purchased from H.M. Stationery Office, Adastral House, Kingsway, London, W.C.2, at the prices indicated.

3. It is pointed out that the "Triptique" issued by the Royal Aero Club of Great Britain does not cover Customs clearance but exempts owners of aircraft from paying the usual Customs deposit on their machines when entering certain foreign countries.

(No. 94 of 1927.)

Rules as to Signals

1. As a result of a recent decision by the International Commission for Air Navigation, paragraphs 14 and 16 of Annex D, Section III, of the International Air Convention have been amended to read as follows:—

14. (a) An aircraft wishing to land at night, without being compelled to do so, on an aerodrome having a ground control shall, before landing, make intermittent signals either with a lamp or a projector, other than the navigation lights or with any sound apparatus. In addition it shall make by international Morse Code, etc., . . . (unchanged).

(b) Permission to land will be given by the same two-letter sign from the ground, made with a green light and followed by intermittent signals of the same colour.

16. An aircraft compelled to land at night shall before landing make with its navigation lights a series of short and intermittent flashes.

2. The above amendments will become effective as from February 10, 1928, and it will be noted that coloured pyrotechnics will then no longer be used, and that some form of lamp or projector or of sound apparatus will be required to enable the new regulations to be observed.

3. An amendment to the Air Pilot pages 32-33, will be made in due course.

(No. 95 of 1927.)

Signals During Foggy Weather

NOTICE to Airmen No. 90 of 1927 is cancelled and replaced by the following:—

In the event of fog or mist obscuring the Airport of London, Croydon, or Lympne Aerodrome, Kent, their presence will be indicated to pilots of incoming aircraft by firing pyrotechnic lights of any colour other than red lights, which are reserved for use solely as an instruction to aircraft not to land. The actual colour of pyrotechnics employed will be left to the discretion of the C.A.T.O. in charge and will be the colour which, in his opinion, is most likely to be visible under the existing conditions of fog or mist.

(No. 96 of 1927.)

GROUND ENGINEERS**Modifications to "Moth" Aircraft, "Cirrus" Engine**

(1) RENEWALS of Certificates of Airworthiness will not, in future, be granted until the aircraft embodies the modifications referred to herein. Ground engineers should, therefore, ensure that all such aircraft, for which they are responsible, have these modifications embodied.

This requirement is applicable to "Moth" aircraft of the following types:—D.H.60, Mark I; D.H.60, Mark II; D.H.60X, Mark II.

(2) **Fuel System.**—The fuel system is to be modified in accordance with the following drawings:—
Mod. D.H./60/Mk.1 Drg. U/691 and M. 789; Mod. D.H./60/Mk.2/G.A. 1074 and M. 790; Mod. D.H./60X/Mk.2/G.A. 1095 and M. 791.

A brief description of the above modification is given as follows:—

(a) Owing to the risk of air lock the existing type cock is replaced by a modified type of cock.

(b) The pipe line between the tank and carburettor is increased from $\frac{1}{2}$ in. diameter to $\frac{3}{4}$ in.

The reason for this modification is that there is a possibility with the present system, under certain conditions of head of petrol, etc., for an inadequate supply of petrol to reach the carburettor.

(3) **Mixture Control.**—The carburettor mixture control is to be modified in accordance with Mod. No. Moth/518. This alteration makes the inter-locking between the mixture regulator and throttle levers of a more positive character, thereby removing the present risk of the throttle lever being sprung past the mixture regulator lever and so leaving the latter in a partially or fully closed position.

(4) The vent in the main fuel tank must be kept clear and maintained in the standard position with the opening facing forward and cut off at an angle of approximately 45°.

(No. 8 of 1927.)

A. Repairs to Civil Aircraft. B. Engine Installation Requirements; Fire Prevention**A.—Repairs to Civil Aircraft**

(1) GROUND engineers are reminded that repairs to aircraft or engines which they are permitted to carry out under Paragraph 47 of the Air Navigation Directions (A.N.D.6), are limited to repairs which do not involve any modification of the detail design of the approved type of aircraft or engine.

(2) Repairs which do alter the detail design of the approved type must be regarded as modifications and dealt with as laid down in Paragraph 26 (b) of A.N.D.6.

(3) Information as to the method of obtaining approval of any contemplated method of repair can be given by the Inspector in Charge, A.I.D., at the works of the constructor of the aircraft or engine concerned.

(4) Ground engineers licensed in categories B and D must satisfy themselves that this design approval has, in fact, been obtained before they certify repairs of this description and must include a reference to the authority received in the aircraft or engine log-book entry.

B.—Engine Installation Requirements: Fire Prevention

(1) The operation of notice to ground engineers No. 6 of 1927 on the above subject is hereby suspended until further notice.

(No. 9 of 1927.)

IN PARLIAMENT

Ex-Enemy Air Raids (Casualties)

MR. CECIL WILSON, on December 14, asked the Secretary of State for Air whether there is any record as to the civilian lives lost, and as to the value of property destroyed in Great Britain by German aircraft during the war; and whether the information can be published?

Sir S. Hoare: In answer to the first part of the question, I understand that the number of civilians killed in Great Britain by German aircraft during the War was 1,117. As regards the second part, I am making inquiries and will communicate later with the hon. Member.

Civil Aviation

Sir J. POWER asked the Secretary of State for Air the total mileage flown by the British, French, German and Italian commercial air services for the last period for which the statistics are available?

Sir S. Hoare: The latest official figures of the civil air transport mileage of the countries referred to are those for the year 1926, and are as follow:—Great Britain, 840,000 miles; France, 3,244,000 miles; Germany, 4,064,000 miles; Italy, 325,000 miles. These figures are approximate, and the Italian figure does not represent a full year's operation.

Capt. A. EVANS asked the Secretary of State for Air the fees charged by each individual aeroplane school in Great Britain which is officially recognised by the Air Ministry for civilian flying instruction; and if he anticipates these fees being reduced in the near future?

Sir S. Hoare: There are no officially recognised schools for civilian flying instruction, and I have no information in regard to the exact fees charged by the various schools to their ordinary pupils. I understand, however, that the cost of training for a private pilot's licence may be taken as ranging between £90 and £120, approximately. I cannot say whether any reduction is contemplated.

SIDEWINDS

FLIGHT has received the following communication from the famous firm of Burch's (401, Strand, W.C.2):—

"We should appreciate your kindness if you would, through the medium of your valuable paper, convey to the officers of the R.A.F. our sincere thanks for the generous patronage they have accorded us during the past year, and to tender our heartiest good wishes for a very Happy and Joyful Christmas and a Bright and Prosperous New Year with the best of good luck."

An interesting communication has been received by the Bristol Aeroplane Co., Ltd., from the engineer who was in charge of the D.H. 50 seaplane "Pelican," fitted with Bristol "Jupiter" Series VI engine, with which an aerial service was conducted in East Africa by the North Sea Aerial and General Transport, Ltd.

"I must say," writes this engineer, "that the 'Jupiter VI' is the sweetest running and most efficient aero engine that has been under my care. Our particular engine worked in atmospheric temperatures varying from 12° C. to 40° C. No repairs were necessary, and only current routine maintenance was carried out."

"The engine started every time on one touch of the propeller after two revolutions of sucking in. A Saintin starter was fitted, but it was found that less manual energy was expended in the intense heat by the above method, than that required to pump up the air bottle of the starter. Two natives were usually persuaded to do the sucking in. Standing on the float behind the engine, the propeller was given a slight movement, and with the aid of the starting magneto, never failed to start on the first attempt."

Spanish Royalty at Cricklewood

THE Infante Alphonso, Commandant of the Royal Spanish Aerial Gunnery School, the Infanta Beatrice and Capt. Del Val, an officer in the Spanish Air Force, visited the Handley-Page works at Cricklewood on December 14. They examined the slotted wind device operating in a wind tunnel, as the bad weather forbade a flying demonstration.

R.A.F. in Action

WAHABI raiders made an attack on tribes in Iraq on December 13, and carried off camels and other property. R.A.F. machines patrolling the frontier saw the raid, and attacked the Wahabis, who made an attempt at retaliation. One machine is reported to be damaged, and a mechanic slightly injured.

Air Transport in the Yukon

AERIAL transport has been inaugurated in the Yukon territory by the monoplane "Queen of the Yukon" which made the flight from Skagway in slightly more than one hour. A service for passengers, mails and freight will start immediately.

Pioneer's End

THE body of Count de Lesseps, who lost his life while carrying out an air survey in Northern Canada, was conveyed 600 miles from Newfoundland to Quebec, and buried there on December 14.

IMPORTS AND EXPORTS, 1926-1927

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1926 being given in FLIGHT, January 20, 1927.

| | Imports. | | Exports. | | Re-Exports. | |
|----------|----------|---------|-----------|----------|-------------|-------|
| | 1926. | 1927. | 1926. | 1927. | 1926. | 1927. |
| Jan. .. | £ 494 | £ 1,850 | £ 130,049 | £ 49,021 | £ — | £ — |
| Feb. .. | 2,089 | 679 | 40,416 | 63,080 | 6,341 | — |
| Mar. .. | 1,001 | 7,087 | 92,840 | 106,478 | 9,758 | 2,270 |
| Apr. .. | 536 | 822 | 160,832 | 71,190 | 5,051 | 785 |
| May .. | 342 | 1,258 | 118,539 | 82,708 | — | 640 |
| June .. | 24,866 | 1,249 | 66,111 | 149,907 | 150 | 162 |
| July .. | 16,033 | 1,798 | 39,047 | 104,167 | — | 750 |
| Aug. .. | 21,401 | 2,453 | 146,129 | 78,742 | 1,035 | — |
| Sept. .. | 3,172 | 2,045 | 55,674 | 61,946 | — | 59 |
| Oct. .. | 528 | 1,013 | 41,968 | 93,004 | 30 | 45 |
| Nov. .. | 1,069 | 3,014 | 118,648 | 111,202 | 250 | — |
| | 71,531 | 23,268 | 1,010,253 | 971,445 | 22,615 | 4,711 |

PUBLICATIONS RECEIVED

Lynx IV Aero Engine. Air Publication 1287. September, 1927. H.M. Stationery Office, Kingsway, London, W.C.2. Price 2s. 6d. net.

Jupiter Series VI Aero Engine. Air Publication 1278. September, 1927. H.M. Stationery Office, Kingsway, London, W.C.2. Price 2s. 6d. net.

The Accessory. Vol. 13. No. 142. November, 1927. Brown Brothers, Ltd., Great Eastern Street, London, E.C.2.

Aeronautical Research Committee Reports and Memoranda: No. 1098 (Ae.277). The Distribution of Pressure over a Monoplane and a Biplane with Wings of Unequal Chord and Equal Spin. By A. S. BATSON, A. S. HALLIDAY and A. L. MAIDENS. February, 1927. Price 1s. 3d. net. No. 1100 (Ae.278).—Wing Tunnel Experiments on the Effect on the Maximum Lift of Withdrawing and Discharging Air From the Upper Surface of an Aerofoil. By W. G. A. PERRING and G. P. DOUGLAS. April, 1927. Price 6d. net. H.M. Stationery Office, Kingsway, London, W.C.2.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.e. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1926

Published December 22, 1927

- 20,924. T. SLOPER. Wheel mountings. (281,013.)
23,024. AIRSHIP GUARANTEE CO., LTD., C. D. BURNLEY, B. N. WALLIS, N. S. NORWAY, and J. E. TEMPLE. Rigid airships. (281,041.)
24,990. J. S. DREWRY and SHELVOKE and DREWRY, LTD. Means for replenishing fluid supplies on aircraft and removing fluid supplies therefrom. (281,056.)

APPLIED FOR IN 1927

Published December 22, 1927

547. G. MENGDEN. Air logs. (281,116.)
9,739. DR. C. DORNIER and DORNIER METALLBAUTEN GES. Apparatus for varying the flow on the wings of aeroplanes. (272,455.)
10,283. ROHRBACH METALL-FLUGZEUGBAU GES. Mounting of engines on aircraft. (269,898.)
12,421. A. ROHRBACH. Construction of hollow, wedge-shaped, metal bodies for use on aircraft. (271,453.)
17,065. J. A. STEINMETZ. Mooring dirigible aircraft. (281,187.)

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